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Kirstenbosch, Newlands, Cape Province
Editor: H. B. Rycroft*

Supplementary Volume No. III

THE GENUS BABIANA

By

G. JOYCE LEWIS

*Botanical Research Officer, National Botanic Gardens of S.A.,
Kirstenbosch*

(With [illegible] plates by the author and [illegible] photographs)

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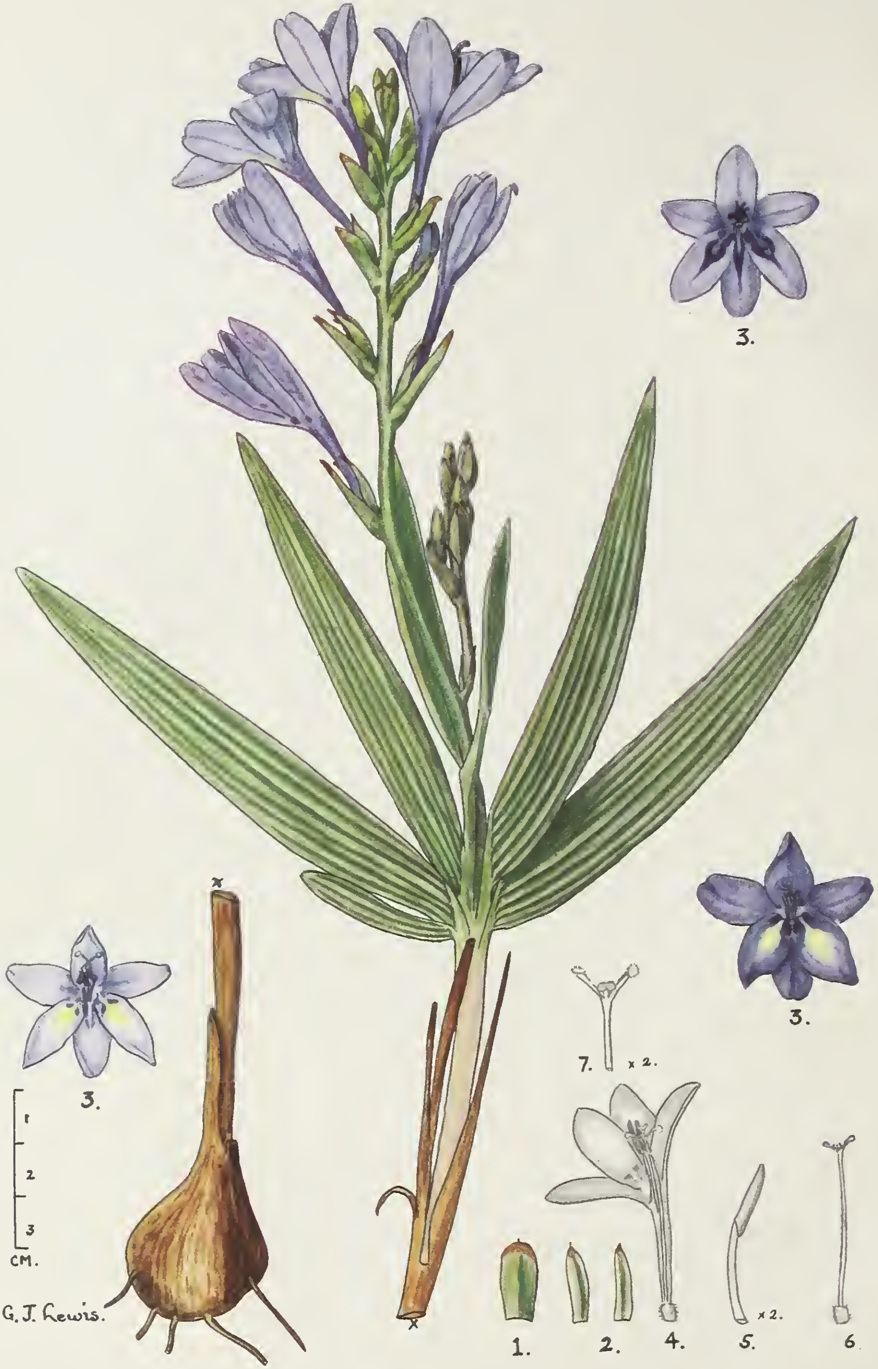

PLATE 1.
Babiana plicata Ker. (Slightly reduced.) Plant from Signal Hill, Cape Peninsula.
1. Bract. 2. Bracteoles. 3. Flower, front view, from three different plants.
4. Section of flower. 5. Stamen × 2. 6. Gynaecium. 7. Top of style and style branches × 2.

Frontispiece

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(*With* 23 *plates by the Author and* 10 *photographs*)

May, 1959

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CONTENTS

PAGE

List of Plates 4

Introduction 5

Acknowledgments 6

Historical Note 7

Note on *Gladiolus plicatus* L. and *Babiana plicata* Ker. 11

Geographical Distribution 13

Diagnostic Characteristics:

(1) Corm 15

(2) Stem 15

(3) Leaves 16

(4) Bract and Bracteoles 17

(5) Flowers 17

Hybridisation 19

Description of the Genus 20

Keys to the Sections and Species 21

Descriptions of the Species 28

Excluded Species 136

Bibliography 139

List of Numbered Specimens Quoted 141

Index 147

LIST OF PLATES

1. *Babiana plicata* .. .. *Frontispiece*
2. *B. villosula* .. .. Facing page 12
3. *B. blanda* .. .. ,, 30
4. *B. pygmaea* .. .. ,, 34
5. *B. foliosa* .. .. ,, 38
6. *B. stricta* .. .. ,, 42
7. *B. stricta* var. *erectifolia* .. .. ,, 46
8. *B. purpurea* .. .. ,, 50
9. *B. lineolata* .. .. ,, 54
10. *B. odorata* .. .. ,, 60
11. *B. ambigua* .. .. ,, 64
12. *B. ambigua* x *nana* var. *angustifolia* .. .. ,, 66
13. *B. scabrifolia* .. .. ,, 68
14. *B. scabrifolia* .. .. ,, 70
15. *B. salteri* .. .. ,, 74
16. *B. minuta* .. .. ,, 76
17. *B. nana* .. .. ,, 80
18. *B. crispa* .. .. ,, 84
19. *B. pilosa* .. .. ,, 88
20. *B. sambucina* var. *longibracteata* .. .. .. ,, 94
21. *B. flabellifolia* .. .. ,, 98
22. *B. pauciflora* .. .. ,, 100
23. *B. truncata* .. .. ,, 102
24. *B. attenuata* .. .. ,, 106
25. *B. curviscapa* .. .. ,, 108
26. *B. geniculata* .. .. ,, 110
27. *B. pubescens* .. .. ,, 112
28. *B. scariosa* .. .. ,, 122
29. *B. brachystachys* .. .. ,, 126
30. *B. sinuata* .. .. ,, 128
31. *B. unguiculata* .. .. ,, 130
32. *B. fimbriata* .. .. ,, 132
33. *B. tritonioides* .. .. ,, 134

THE GENUS BABIANA

INTRODUCTION

The need for a revision of the South African Iridaceae has long been felt but comparatively little progress to this end has been made by systematists. During the past twenty-five years revisions of six of the genera have been published but, except for my own work on Synnotia, they have been undertaken by botanists working in herbaria outside this country, viz. Freesia and Dierama by N. E. Brown in England, Aristea and Nivenia by Weimarck in Sweden and Geissorrhiza by Foster in America. However, these are the only genera which have received any serious systematic study and for the rest the standard work is that of Baker in the sixth volume of the Flora Capensis, published in 1896, with the addition of numbers of species named and described in various botanical works since then, and many changes in nomenclature.

In his work on the Iridaceae Baker was seriously handicapped by two major obstacles. The first is that he had to deal entirely with herbarium specimens, many of them imperfect and poorly dried, and had at his disposal a very limited amount of material, often only one specimen of a species. The flowers in most of the genera are delicate and when dried tend to lose or change their colour, also, unless the greatest care is taken, the floral characters are obscured and details and measurements can seldom be accurately obtained by boiling or soaking the flowers.

The other difficulty encountered by Baker, and indeed by all who work on the family, is the fact that the brief and inadequate descriptions of species given by many botanists in the eighteenth and nineteenth centuries left much doubt as to their identity, with the result that many of the horticultural favourites and commoner species were named several times, and this, combined with misidentifications, has led to much confusion and given rise to some serious problems in the nomenclature.

The variability of the floral and other characters largely relied on for differentiation and classification has also added to the confusion and presented some problems which can only be solved by studying the plants in the field. For example, in the more arid regions there is nearly always a very marked contrast in the sizes of plants growing in sun and partial shade, and it has happened that these forms have sometimes been described as different species (see note under *Babiana scabrifolia*). Many of the plants figured by Jacquin and others in Europe resemble the elongated shade forms and the smaller more typical forms in herbaria have not always been recognised by botanists as belonging to the same species.

The present revision is the outcome of several years of study of the plants in the field and in cultivation in the National Botanic Gardens of South Africa, Kirstenbosch. Almost all of the available types have been examined but one or two have not been traced and a few, of which no illustrations or isotypes exist, were destroyed during the last war. These are mentioned at the end with the *nomina nuda* and excluded species. The number of species given in the second edition of Phillips' Genera of South African Plants (1951) is "about 80" but in this revision it is reduced to 61, of which 24 are new species. It was found that many of the earlier species had to be relegated to synonymy, and that several errors in nomenclature have had to be rectified.

Detailed descriptions are given of the known species, the majority drawn from living plants. Several of the older species previously described from one or two specimens have been rediscovered during the past twenty-five years, but it is regretted that the descriptions of a few of the new species described here are drawn from one or two herbarium specimens; this has only been done in the case of those which are so distinct as to necessitate this. In the collections of one or two herbaria some incomplete specimens have been seen which I have not been able to identify and although it is fairly certain that they represent new species, I cannot name or describe them until more material becomes available. For this reason the revision is not considered to be complete, nor is the synonymy entirely complete as I have omitted a few names that have been published in literature to which I have not had access. Opinions may differ about my conception of some of the species and varieties. It is hoped that in the near future workers on cytology or pollen analysis might throw more light on the species problems in the Iridaceae—field work helps to solve many but not all.

ACKNOWLEDGMENTS

The greater part of the cost of publication has been met by the Fourcade Fund, the University of Cape Town.

Throughout the period during which I have worked on this genus many persons have kindly assisted me in various ways and I should like to record my grateful thanks to them.

Firstly, I wish to express my sincere gratitude to Dr. L. Bolus for her tuition and guidance at the start of my botanical career, and for directing my interest to the Iridaceae, when the genus Babiana immediately attracted my special attention. I am greatly indebted also to Capt. T. M. Salter for the interest he has taken in my work and the

assistance he has given me in preparing the Latin diagnoses. On his expeditions in search of Oxalis, he collected several species of Babiana, one of which is now named in his honour.

During the years I was on the staff of the South African Museum, Prof. R. H. Compton, and later Prof. H. B. Rycroft, Directors of the National Botanic Gardens, invited me to join in many of the botanical expeditions which they organised, and to both of them I am very grateful as these expeditions enabled me to carry out much of the field work on the genus.

Many of the old types were examined during a few months spent in England and Europe in 1949, and for assistance and facilities provided for carrying out this work I am most grateful to the Directors and Curators of the following herbaria: Kew; British Museum; Linnaean Herbarium, London; Herb. Thunberg, Botanical Gardens and Museum, Uppsala; Herb. Lamarck, Natural History Museum, Paris; Herb. Delessert, Geneva. Other types were included in Babiana collections sent on loan for study and comparison here, and my thanks are due to the Directors and Curators who, through their courtesy and co-operation, made the material of the following institutions available for this purpose: Royal Botanic Gardens, Kew; Natural History Museum, Paris; Berlin-Dahlem Herbarium; Botanical Museum, University of Zürich; Bolus Herbarium, University of Cape Town; National Herbarium, Pretoria.

For advice about some problems in nomenclature I have to thank Mr. A. Bullock, Dr. M. R. Levyns and Dr. E. Schelpe; Dr. Schelpe has also rendered me great assistance in arranging for some of the type sheets to be photographed at the University of Cape Town. Others whom I wish to thank for information and advice are Miss W. F. Barker, Curator of the Compton Herbarium; Mr. Savage, Keeper of the Linnaean Herbarium; and Capt. T. T. Barnard, who shares my interest in the South African Iridaceae and cultivates many of them with great success in England.

Finally, for permission to reproduce four of my illustrations which have already appeared in Flowering Plants of South Africa, I have to record my thanks to Dr. R. A. Dyer, Chief of the Division of Botany, Pretoria, and editor of Flowering Plants of Africa.

HISTORICAL NOTE

The genus was established in 1802 by Ker, who derived the name from "Babianer", an anglicized version of the spelling of bobbejane (baboons), the common name by which these plants were known at the Cape because their corms are a favourite food of these animals. The type species, *Babiana plicata*, was figured in Curtis's Botanical Magazine in August, 1802 (t. 576), with a Latin diagnosis of the genus and species by Ker. In his notes following the description, Ker added: "For the derivation of the generic name and an enumeration of such species as are as yet described, revert to *Ixia conica*, No. 539 of this work. From this list *Gladiolus crispus* should be excluded".

Under *Ixia conica* in Bot. Mag. t. 539, published the previous year, Sims had expressed the need for a reform of the present constituent genera of the Iridaceae, and stated that there was one group "so very distinct at first sight from the rest, by their smooth sheathing petioles, terminated in general by a plicate and villose leaf, with their bulbs situated unusually deep in the earth, that Mr. Gawler (who later changed his name to Bellenden Ker) has with the greatest propriety united these into a separate genus, with the name of Babiana". He gave the derivation of the name and added that, with several hitherto undescribed species, the genus would contain a number of species which were at that time dispersed in the genera Ixia, Gladiolus and Antholyza, and listed sixteen of them. With the one exception mentioned above, these were transferred to Babiana by Ker between 1802 and 1807.

N. E. Brown interpreted Sims' premature announcement about Babiana in 1801 as constituting the establishment of the genus, for in a note under the description of *Babiana Gawleri* in Hooker's Ic. Pl. t. 2710 (1905), he wrote: "When the genus Babiana was originally established at the place quoted above (i.e. Bot. Mag. sub t. 539), which reference has been overlooked by all subsequent authors, even by Ker himself, since he does not quote it in his Irid. Gen. p. 151". This is not correct, as Baker cited Ker in Bot. Mag. 539 in his Systema Iridacearum, and in view of Ker's reference in the Botanical Magazine it is obvious that he had not overlooked it but that he rightly considered that the genus dated from 1802, when the first detailed description was published. Sims gave no diagnostic characters, apart from the brief mention of the leaves and corm.

By 1827, when his Genera Iridearum was published, Ker had transferred to Babiana about 18 species which had been described, and many of them figured, before the end of the eighteenth century, by the botanists Linnaeus and his son, Thunberg, Burmann f., Jacquin, Aiton and one or two others. Lamarck's publications could not have been seen by Ker as he did not refer to them.

In 1812 Salisbury published a new generic name, Acaste, in Trans. Hort. Soc. 1, p. 322, with two species, *Acaste venusta* and *A. pulchra*. He gave no descriptions but under the first species, *A. venusta*, cited Curtis in Bot. Mag. t. 410 (1798). This is a good figure of *Ixia rubro-*

cyanea Jacq. (=*B. rubrocyanea*), accompanied by a brief Latin description of the genus and a full description of the species in English. Salisbury made the following note under *A. venusta*: "The generic name was suggested many years ago by Mr. Correa de Serres, who first taught us all, that both regular and irregular flowers might occur on the same spike in some species of this genus". *A. venusta* is a synonym of *Babiana rubrocyanea* (Jacq.) Ker, but in 1877 Baker adopted Salisbury's generic name for a subgenus of Babiana and it was used also by Bentham and Hooker in 1883, though they divided the genus into sections instead of subgenera.

In 1824 Burchell described a new species, *B. hypogea*, which he had found on his travels in the interior of South Africa, and three years later Ecklon published a topographical report on the plants collected by himself in this country, in which he listed 22 species of Babiana. Half of this number were species already named by Ker, the others being named by Ecklon, but several of his names have since proved to be synonyms and the rest must be regarded as *nomina nuda* as he gave little or no description of the plants, usually only a brief note on the colour of the flowers.

During the next thirty to forty years little work was done on the Iridaceae, but in the second half of the century Klatt made a considerable contribution to the literature of the family in a series of papers published in Linnaea, such as his Revisio Iridearum (Linnaea xxxii (1863)). In one of his papers he described a new species of Babiana and in 1882 he described several more species in his commentary on Baker's Systema Iridacearum, bringing the total number of species listed by him to 31. In addition, there are 3 species which he placed in Antholyza, one a new species named by him *Antholyza fimbriata*, another *Gladiolus striatus* Jacq., and the third *Babiana hypogea* Burch., which for some extraordinary reason he transferred to Antholyza.

Baker's Systema Iridacearum was published in 1877 and marks an important advance in the history of the family, for in it he collected together most of the available data previously scattered through a number of botanical works, gave descriptions of the genera, keys to the tribes and genera and a synonymic list of the known species, with brief notes on their geographical distribution. In his second major work on the family, the Handbook of the Iridaceae (1892), he gave descriptions of the species, and this was followed in 1896 by his classification of the South African members of the family in the sixth volume of the Flora Capensis.

Baker listed 19 species of Babiana in his Syst. Irid., 5 of them either new species or new combinations of his own, while some of Ker's he reduced to varieties or synonymy. In the Handbook he gave descriptions of 27 species, one of them being the only species known to occur outside Southern Africa, *B. socotrana*, which was described and figured by Hooker f. in 1881. This is naturally not included in the Flora Capensis where the number of species is 26. Like Ker, Baker either overlooked or was unaware of Lamarck's work in which he described some new species of Babiana—placed in Gladiolus—and under Ixia or Gladiolus gave fairly detailed descriptions of a number of those already named. One of Lamarck's specific epithets is now used for a species of Babiana (see *B. pubescens* (Lam.) Lewis).

A year before the publication of the Flora Capensis, the botanists Durand and Schinz produced a Conspectus of the Flora of Africa, in which they listed 39 species of Babiana. The increase of 12 over Baker's total is due to the fact that they upheld as separate species all those described by Klatt, also most of Ker's, whereas Baker reduced many of them to varieties or synonymy.

In the sixty-three years since the publication of the Flora Capensis, about 30 more species have been described by several botanists and a few changes made in the nomenclature. Dr. L. Bolus is the author of many of these and several were described by myself, while one or two each are attributed to Baker, Schinz, N. E. Brown, Dinter, Schlechter and Phillips. The 2 species placed by Baker in the subgenus Antholyzoides, *B. ringens* (L.) Ker and *B. thunbergii* Ker, were removed from Babiana by N. E. Brown in 1932 (Trans. Roy. Soc. of S. Afr. Vol. xx), and the former reinstated by him as the type of the monotypic genus Antholyza, while the latter he placed in a new genus, Anaclanthe. Two species from other genera were transferred to Babiana by myself between 1934 and 1941, namely *B. brachystachys*, which was described as an Acidanthera by Baker, and *B. striata*, named *Gladiolus striatus* by Jacquin and placed in Tritonia by Ker and in Antholyza by Klatt.

The above short history will give some idea of the confused state of the genus when the present work was started, with the different conceptions of the species revealed by the works of Baker and Durand and Schinz in 1895 and 1896, and the addition since then of a mass of publications scattered through a large number of different botanical works. Ker predicted at the time when he founded the genus that it would turn out to be among the largest in the family, and this has proved to be correct.

NOTE ON *GLADIOLUS PLICATUS* L. AND *BABIANA PLICATA* KER

The connection between *Gladiolus plicatus* L. and *Babiana plicata* Ker is indirect, since Ker did not base *B. plicata* on the Linnaean species, but as both have been completely misunderstood, and among the plants which have been named *B. plicata* in herbaria there are a large number which match the type of *Gladiolus plicatus* L., it is necessary to go into some detail to clarify the position and establish the identities of these two species.

Linnaeus described *Ixia plicata* in 1759 (Amoen. Acad. iv, 300) from a plant flowered in Sweden from corms sent to him by Burmann. Three years later he transferred *I. plicata* to the genus Gladiolus (Sp. Pl. ed. 2, i, 53 (1762)). An examination of the specimens in the Linnaean Herbarium, together with his description, leaves no doubt as to the identity of the species. There are two sheets in the herbarium, 59.5 and 59.6, the first named *Gladiolus plicatilis* and the second *G. plicatus* by Linnaeus. On sheet 59.5 there are three specimens, the two lower conspecific and the upper a different species. According to information received from Mr. Savage, Keeper of the Linnaean Herbarium, "the upper specimen looks like a later addition as it is partly stuck over the lower right hand specimen". This upper specimen has distinctly zygomorphic flowers and a 5-flowered spike and does not answer to the description of *G. plicatus:* "*floribus* 2 *s.* 3 *violaceo albis regularibus*". (It is *Babiana ambigua* (R. & S.) Lewis). The lower specimen on the left is Sparrman 57 and the right is marked by Sir J. E. Smith "*tenellus* Salisb. Hort." Both agree with the description of *Gladiolus plicatus* but neither can be the specimen described by Linnaeus. On page 8 of his Catalogue of the Linn. Herb. (1945), Mr. Savage noted that Sparrman 57, in list 1772 of Linnaeus' correspondence, was named *G. plicatus* by L., so the name "*plicatilis*" on the sheet was probably an error.

On sheet 59.6 there are two nearly identical specimens of the same species as the two lower on the previous sheet. The one on the right is marked Sparrm. 85 by Linnaeus, but as Sparrman's specimens were not received until after the publication of *G. plicatus*, the type must be the specimen on the left, which is named *G. plicatus* by Linnaeus. It is a complete plant with traces of a corm, and on Sparrman 85 there is a complete corm.

Up to this point the position is clear, for the type and the two Sparrman specimens and the one marked *tenellus* Salisb. Hort. are conspecific and all agree with the description of *G. plicatus*. Unfortunately, the complications which followed arose partly from the presence of the specimen of *Babiana ambigua* on sheet 59.5 and partly from the fact that under the description of *Gladiolus plicatus* Linnaeus cited Miller Ic. 155, f. 1 "*Absque synonymo*". Miller's figure is a good one of *Babiana stricta.*

Thunberg added to the confusion by identifying three or four more species with *Gladiolus plicatus* and the long and detailed description he gave in 1884 (Diss. Gl. 24) is of one or more of these. His description of the flower does not agree at all with that of Linnaeus, who described the flower as regular, whereas Thunberg described a bilabiate flower. On the seven sheets named *G. plicatus* in his herbarium, there are about seven different species, one of which, though not the one described, is the same as *G. plicatus* L. By 1802 the identity of *G. plicatus* L. was completely obscure and the name was applied to such diverse species as *Babiana tubulosa* var. *tubiflora* (Lam. Encyc. ii, 724 (1786)), and *B. stricta* var. *sulphurea* (Andr. Bot. Rep. t. 268 (1802)).

This was the position in 1802 when Ker established the genus Babiana and unfortunately named the first species he described *B. plicata.* It is clear that Ker did not associate *B. plicata* with *Gladiolus plicatus* L., for in the synonymy he cited *G. plicatus* Thunb. "?nec vero Linn. vel Jacq.", and a few months later, when he transferred *G. strictus* Ait. to Babiana, he cited *G. plicatus* L. as a synonym of that species, undoubtedly on account of Miller's figure which Linnaeus had cited under *G. plicatus.*

The species to which Linnaeus gave the name *G. plicatus* is one of the commonest at the Cape, and like most of the common ones it has been renamed three or more times. Since it is not the same as *Babiana plicata* Ker, nor *B. stricta* (Ait.) Ker, and the use of the name *B. plicata* for the type species prevents the restoration of the Linnaean epithet, it must now be known by the oldest available name which appears to be *B. villosula* (Gmel.) Ker ex Steud. I am not certain whether Ker actually used this combination but it was attributed to him by Steudel (Nom. ed. 1, 371 (1821)). The full synonymy is given under *B. villosula* but very briefly the history of the nomenclature is as follows:—

In 1796 Gmelin gave the name *Ixia villosula* to the plant figured and described by Jacquin as *I. villosa* (Ic. t. 284 (1786–93)), probably because the name had been used for a different species by Aiton in 1789. Ker transferred *I. villosa* Ait. to Babiana in 1802, as *Babiana villosa,* and in 1805 he transferred *Ixia villosa* Jacq. to Babiana, naming it *Babiana obtusifolia.* Baker reduced *B. obtusifolia* to a variety of *B. stricta* in 1896, but in 1906 he described a single specimen of this species as *B. orthosantha.* In 1932 the species was again described as new and named *B. hiemalis* by Dr. L. Bolus, and since then has been known by that name in this country.

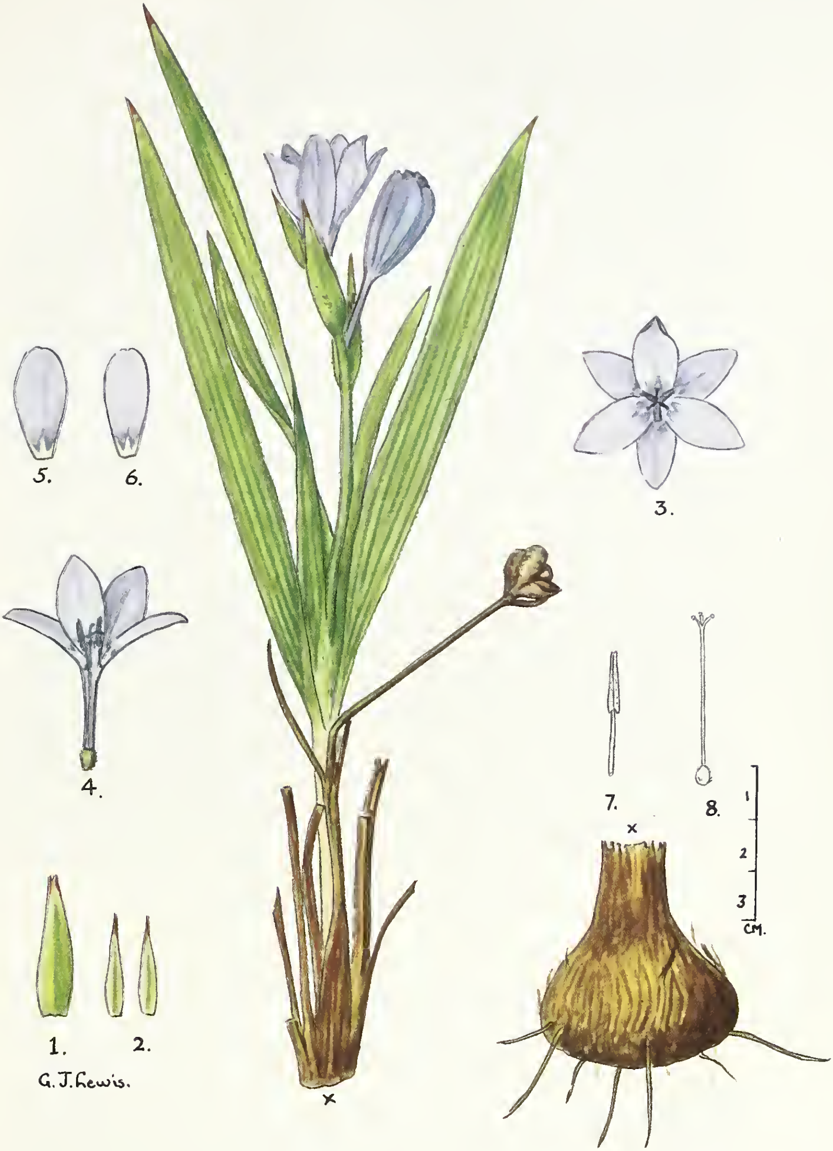

PLATE 2.

B. villosula (Gmel.) Ker ex Steud. (Slightly reduced.) Plant from slopes of Table Mountain, above Cape Town.

1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower. 5. Outer perianth lobe. 6. Inner perianth lobe. 7. Stamen × 2. 8. Gynaecium.

Two factors have contributed to the confusion about the identity of *B. plicata* Ker, one of which is his reference to *Gladiolus plicatus* Thunb., which, as pointed out above, is a mixture of several species. Of the seven sheets bearing the name in Thunberg's herbarium, only sheet c, and the left-hand specimen on sheet d, are *Babiana plicata.* Probably more important, however, is the fact that a few months after the publication of *B. plicata,* Ker described and figured *B. disticha* as a new species (Bot. Mag. t. 626), not realizing that it was merely a form of *B. plicata.* The later name has since been applied to the species while in most herbaria two entirely different species, *B. villosula* and *B. ambigua,* have been identified as *B. plicata.* As mentioned above, these 2 species are mounted together on one of the sheets of *Gladiolus plicatus* in the Linnaean Herbarium, and it is perhaps for this reason that they have been confused with *Babiana plicata,* though neither of them agrees with Ker's figure or description. In the synonymy Ker cited *Gladiolus fragrans* Jacq. (Hort. Schoenbr. t. 14) under *Babiana plicata,* and *Gladiolus plicatus* Jacq. (Ic. t. 237) under *Babiana disticha.* Sprengel recognized that these two figures represented the same species but cited both under *B. disticha* (Syst. i, 156 (1825)), and upheld *B. plicata* Ker as a separate species.

B. plicata is extremely variable and many variations and colour forms have been found within a small area on the slopes of Lion's Head on the Cape Peninsula, some of which match Bot. Mag. t. 576 and others t. 626, with many intermediates. The size of the plants and length of the bracts and perianth tube all show considerable diversity and the colours vary from white, with a little yellow on the lower lateral lobes, to blue and deep mauve or violet. It is very probable that hybridization with *B. stricta,* which grows on the lower mountain slopes and flowers at the same time, has played some part in producing some of the forms or notomorphs. A plant of *B. plicata,* with three different flower forms, is figured on Plate 1, and *B. villosula* is illustrated in Plate 2.

GEOGRAPHICAL DISTRIBUTION

With the exception of *B. socotrana,* which is endemic to the island of Socotra, the genus is confined to Southern Africa, with the majority of species in South Africa and four in South West Africa, one of which, *B. hypogea,* extends across the northern districts of the Cape Province to Bechuanaland, the Transvaal and Southern Rhodesia. This peculiar distribution, with one species endemic to Socotra, has been recorded in other genera besides Babiana; it was mentioned by Hooker f. under the description of *B. socotrana* in Bot. Mag. t. 6585 as "another instance of that botanical affinity of Socotra with the Cape alluded to under

Begonia socotrana". A very recent record is that of Meeuse who described a new species of Angkalanthus (Acanthaceae) from the Transvaal in 1956 (Fl. Pl. Afr. xxxi, t. 1227), the only species previously known being from Socotra.

Of the four species recorded from South West Africa, one is endemic and another confined to the south-western corner and neighbouring north-western parts of Namaqualand. The other two are the widespread *B. hypogea* and a closely allied species, *B. falcata*, which covers an area extending from South West Africa to the north of Namaqualand and eastwards to Kimberley.

Most of the South African species are concentrated in the winter-rainfall area, from Namaqualand south to the Cape and Caledon Divisions, decreasing from there eastwards to Port Elizabeth and Alexandria, these last two districts being the south-eastern limit of the genus and falling more or less in the summer-rainfall area. One widespread endemic species is *B. sambucina* which extends more or less along the western and southern borders of the winter rainfall, from the Calvinia Division to the Cold Bokkeveld in the Ceres Division and from there south-east through Worcester, Montagu, Laingsburg, Beaufort West, Prince Albert, Ladismith and Oudtshoorn to Port Elizabeth, occurring also in the coastal districts from George to Port Elizabeth. In the summer-rainfall area there are the two species mentioned above, *B. hypogea* and *B. falcata*, and a third which occurs in the Kimberley and adjoining divisions.

Sixteen species are known from Namaqualand, but since this vast area has not been as well explored as other parts of the country there is little doubt that there are still one or two to be discovered. After Namaqualand the greatest numbers are in the Clanwilliam and Malmesbury Divisions—14 and 12 respectively. Ten species are recorded from both Vanrhynsdorp and Calvinia Divisions and 9 from Piketberg, Paarl—Stellenbosch and Caledon. In the Cape and Bellville there are 7 or 8 and 5 or 6 occur in the Divisions of Hopefield, Tulbagh, Worcester, Bredasdorp and Riversdale. In Mossel Bay there are 3 and in Ladismith, George, Oudtshoorn and most of the coastal districts from George to Port Elizabeth and Alexandria there are 2 species.

The most widely distributed species are *B. hypogea* and *B. sambucina* but a few others are also found to cover very large areas, while some are very restricted, such as *B. pygmaea* and *B. rubrocyanea* in the Darling district, *B. auriculata* in the Clanwilliam Division, etc. The species occur at various altitudes ranging from sea-level to about 5,000 ft., rarely above 3,000 ft. in the south-western Cape coastal districts, with one outstanding exception, a variety of *B. hypogea* recorded from altitudes of 6,700 ft. on mountains in the Lydenburg Division, Transvaal.

DIAGNOSTIC CHARACTERISTICS

(1) Corm

The character of the corm is fairly uniform throughout the genus and whereas it is of the greatest importance as a generic diagnostic feature, only a little use can be made of the few variations in determining the species. In almost all species it is situated well below the ground surface, the average depth being about 4—5 in., though in some it is considerably deeper—specimens of *B. longicollis*, *B. hypogea* and *B. pubescens* have been found with corms 12 in. or more below ground. The plant attains the requisite depth by means of a succession of contractile roots, as far as is known only one being produced by each successive corm. No contractile roots have been seen on mature flowering plants.

The corm varies in shape from ovoid to globose and is fairly small, though sometimes quite large when the surrounding tunics are numerous and densely matted. The fibres composing the tunics vary in colour from pale brown to reddish or dark brown but they are generally reddish brown, fairly fine and soft in texture and either reticulate or vertical and connivent. In all except three species they extend up to the ground surface in a thin or thick neck which encloses and protects the subterranean part of the stem and leaves. Two or three species have hard and more or less lignified corm tunics and in about three others the fibres of the neck are compacted together into a hard narrow cylindrical tube, dark brown or almost black in colour. Several species produce cormlets in the leaf axils on the subterranean part of the stem, but they are usually concealed by the fibrous neck. They are a conspicuous feature in *B. nana*, which has no neck, and in one or two other species when a number often develop together, forming compact clusters of plants, e.g. *B. torta* and *B. crispa*.

(2) Stem

All species of Babiana are caulescent, with a certain portion of the stem below ground, and in nearly all the stem is produced above ground, sometimes up to a foot in length but more often considerably less. The length of the subterranean part depends on the depth at which the corm is situated and in the descriptions the measurements given for the neck of the corm include this part of the stem, while measurements given of the length of the stem are of the aerial portion only, unless otherwise stated.

In *B. hypogea* and the two allied species which occur in the summer-rainfall area the stem is never exserted, the flowers arising just below the surface of the ground. This character has been used in the key for separating this group of species from those with exserted stems. There is a good deal of variation in the aerial part which in some species is erect, in some declinate, and in others very short and decumbent, sometimes barely visible. It is green, terete or angled, and usually more or less pubescent, often velutinous, but there are a few species with glabrous stems. Little use is made of these characters in determination of the species as they are not altogether reliable; for example, species which normally have a very abbreviated decumbent stem may sometimes produce a fairly long and declinate or suberect stem in shade forms, and dwarf forms occur in species such as *B. plicata* in which the stem is usually erect and comparatively tall.

(3) Leaves

The leaves vary in number from 3 to 10 to a plant, the usual number being 5 to 7. They consist of a long colourless petiole closely adpressed to and enclosing the slender underground portion of the stem—in a number of species the petiole extends above ground and becomes green —and a blade which arises more or less obliquely from the petiole and in the majority of species is fairly short, lanceolate, more or less plicate and pubescent. Whether or not these distinct portions of the leaf are a true petiole and blade or lamina, as in the Dicotyledons, is open to some doubt and has been discussed at great length by morphologists, but for lack of any other suitable terms they are used here and in the descriptions.

The form of the blade is of great importance in differentiating species and has been used in many cases in the analysis, for although the majority are as described above, several species are characterized by very different types. They are undulate and somewhat tortuose in a few species, e.g. *B. crispa*, *B. sinuata* and *B. striata*, or spirally curled as in *B. fimbriata*, *B. namaquensis* and *B. torta*, or cuneate as in *B. pubescens*, *B. flabellifolia* and *B. truncata*. The peculiar truncate apex of the cuneate leaves is remarkable and in *B. pubescens* and *B. truncata* they have the appearance of having been grazed. *B. flabellifolia* and *B. truncata* have been studied in cultivation and in both species the juvenile leaves of the young plants are linear, acute and typical of the genus, and it is only in older plants that the leaf apex is not developed. The disappearance of the apex is probably due to climatic conditions, for it was observed that after a few years in cultivation the leaves became longer and less cuneate, with only two or three teeth at the apex.

The terete glabrous leaves of *B. brachystachys* are unique but in this species, too, the juvenile leaves are typical of the genus, being linear, plicate and pilose. *B. stenomera* has glabrous leaves and in *B. dregei* they are glabrous and plicate, with stramineous margins and ribs and the apex pungent. Except for these and one or two other glabrous or subglabrous species, the others are all to a greater or lesser degree pubescent. As far as is known, the hairs are always simple and unicellular and the fact that, as a general rule, they arise only above the veins seems to indicate that they are hygroscopic.

(4) BRACT AND BRACTEOLES

In differentiating species these organs provide some characters of considerable importance. In all except two species the bract is herbaceous, usually pubescent, and varies in shape from lanceolate to oblong or ovate, with the apex acute, acuminate or occasionally truncate or bidentate and often scariose and ferruginous. The pair of bracteoles usually resemble the bract but are always narrower and sometimes slightly shorter, and they are entirely free in some species and in others partially or sometimes almost entirely united. Babiana is unique in the family in having the bracteoles free in some of the species. Two species have bracts and bracteoles which are entirely scariose, pale brown or colourless with brown flecks; in both species the spike is densely many-flowered with the bracts closely imbricate, and since these characters serve to distinguish them from all other species they have been placed in a section on their own (*Scariosae*). The length of the bract and bracteoles in relation to the length of the perianth tube is a useful guide but has to be used with caution as these are subject to considerable variation, as are also the presence or absence of hairs.

(5) FLOWERS

The colours of the flowers range from pure white to cream, yellow, pink, crimson, pale mauve, violet, pale or dark blue, and the flowers are scentless or fragrant with a faint or strong caryophyllaceous or hyacinth-like scent, but though the colour and scent are fairly constant in the species not very much use has been made of the colour in distinguishing species since this character alone is not often of much value in identifying old herbarium specimens. In shape and size there are considerable variations and the flowers may be either actinomorphic, with equal or subequal similar lobes, or zygomorphic with slightly to very unequal dissimilar lobes. It is largely on these floral characters that the species have been grouped into sections, though other organs have been taken into account and are sometimes used instead of or supplementary to the floral characters, such as the scariose bracts and many-flowered spike of the two species placed in the section *Scariosae*.

(i) *Perianth Tube and Lobes*

The length of the perianth tube is of considerable diagnostic value in differentiating species. It was hoped that this character might be used to divide the large section *Babiana* into two sections, but attempts to do this proved unsuccessful as it was found that the length of the tube by itself and in relation to the lobes is too variable, and that the short-tubed species merge into the long-tubed without any distinct dividing line. The tube varies in shape as well as in length and may be straight or curved, almost entirely cylindrical or distinctly infundibuliform. In some species it is conspicuously geniculate shortly below the throat, but though this is very evident in living flowers it is sometimes obscured in the dried state.

The shape and arrangement of the lobes are significant and great importance is attached to this character in the separation of the species and in grouping them into sections. For instance all those species with actinomorphic flowers or with equal or subequal lobes which do not arise obliquely from the perianth tube are placed in the section *Acaste*. In the large section *Babiana* there are various intermediate stages between the few species in which the lobes arise slightly obliquely from the tube, with the dorsal lobe only slightly longer than the others, and the larger number of species in which the flowers are distinctly bilabiate, the dorsal lobe being free and longer than the others and the two upper lateral lobes very shortly united with the three lower lobes in a lip. In the section *Exohebeoides* the flowers are uniformly small and conspicuously bilabiate, with narrow unguiculate lobes, the dorsal being widely separated from the others and considerably longer, and having a long narrow claw. These flowers resemble those of the genus Exohebea and it was for this reason that the name was chosen for the section.

(ii) *Stamens*

The stamens provide some characters of taxonomic importance, especially in their orientation, and to some extent also the shape of the anthers and relative lengths of the filaments and anthers. In all sections except *Acaste* they are unilateral, with suberect or arcuate filaments, but most of the species in the section *Acaste* have stamens symmetrically arranged round the style, though in a few they are sometimes symmetrically arranged and sometimes unilateral, e.g. *Babiana stricta*, *B. villosa* and *B. purpurea*, and in *B. pulchra* they are almost always unilateral and subarcuate. The anthers in the great majority of species are more or less linear-lanceolate but in *B. villosa*, *B. purpurea* and very often in *B. stricta*, they are sagittate, with a broad connective, and on account of their size and dark purple-black colour, are a conspicuous feature in these species. In one species only, *B. sinuata*, the anthers are coherent, usually remaining attached even when dried.

(iii) *Gynaecium*

The ovary is usually oblong, rotund or more or less globose, and varies from glabrous in a large number of species to hispidulous, villous or sericeous in others. The size and shape are somewhat variable and not very reliable characters but one feature of interest is that in *B. hypogea* and the two allied species with flowers arising shortly below the ground surface, the ovary is very shortly stipitate. The absence or presence of pubescence is important and aids in the determination of species.

The style is almost always exserted from the perianth tube but the relative position of the style branches with regard to the stamens is used with some caution as it has been observed in several species that the style lengthens as the flower matures. The style branches and stigmas are on the whole somewhat uniform but they do give a little aid in the case of a few species. The branches are normally short, about 3—5 mm. long, or occasionally slightly less or more, but there is one notable exception, *B. geniculata*, in which the style does not extend beyond the throat of the perianth tube, though the branches are well exserted and 1·1—1·3 cm. long. In the majority of species the branches are more or less spathulate or oblanceolate and conduplicate but in *B. rubrocyanea* they are widely expanded and flattened, and there are one or two species, such as *B. purpurea*, which have fairly large orbicular stigmas.

HYBRIDIZATION

Many of the Iridaceae are known to hybridize very readily and in genera such as Ixia, Freesia, Sparaxis, Streptanthera and Gladiolus, which have been in cultivation for two hundred years or more, there are numerous garden hybrids, many of which have been given horticultural names. This tendency to hybridize is not confined to cultivated plants, however, and Babiana is specially prone to it, for a number of natural hybrids have been observed in the field by myself and one or two have been recorded by other collectors. They are usually fairly obvious as when both parents are present in the neighbourhood characters derived from both can be discerned in the hybrids. Various hybrids which have been found are cited under the species concerned, such as *B. ambigua*, *B. nana*, *B. scabrifolia* and one or two others.

There is no doubt that the occurrence of notomorphs adds to the species problem and the difficulty of determining some specimens, particularly when dealing with herbarium material. To attempt any serious work on the genus with no knowledge of the plants in the field can lead to confusion as in the case of *B. plicata*, and errors such as my own, when I gave the name *B. lata* to a cross between *B. villosula* and *B. blanda* in 1932. At that time I had not studied the genus in the field but a year or two later, when I visited the type locality, my mistake was obvious for within a mile or two I found both parents and a varied assortment of notomorphs.

I have not examined the pollen or ovules of any hybrids so cannot say whether or not they are fertile, but the large number of individuals produced, and the many variations which occur within a small area in two or three species, seem to suggest that some of them are. This requires investigation for if it is proved that fertile hybrids are produced, then it is very possible that hybridization has played some part in the evolution of the genus.

DESCRIPTION OF THE GENUS

BABIANA

Ker in Curtis's Bot. Mag. t. 576 (1802); Ker, Gen. Irid. 151 (1827); Klatt, Linnaea 32: 765 (1863); Baker, Journ. Linn. Soc. 16: 164 (1877); Benth. & Hook., Gen. Pl. 3: 706 (1883); Baker, Fl. Cap. 6: 106 (1896); Levyns, Guide to Fl. Cap. Pen. 80 (1929); Diels in Engl. & Prantl Pflanzenfamilien ed. 2, 15 a: 489 (1930); Lewis in Adamson & Salter Fl. Cap. Pen. 243 (1950); Phillips, Gen. S. Afr. Pl. ed. 2, 219 (1951).

ACASTE Salisb., Trans. Hort. Soc. 1: 322 (1812).

Name derived from bobbejane, baboons (see historical note). The common name for all species is Bobbejaantjie.

Corm ovoid or subglobose, deep-seated, the tunics usually of moderately fine brown or reddish brown fibres nearly always extending up in a long neck. *Stem* usually extending shortly above ground, erect, declinate or very short and decumbent, simple or branched, terete or angled, variously pubescent or sometimes glabrous. *Leaves* with long sheathing petioles below ground and sometimes extending above, the blades mostly short and lanceolate, rarely cuneate or (in one instance only) terete, usually more or less plicate, sometimes undulate or tortuose, variously pubescent or occasionally glabrous. *Spike* distichous, spirally arranged or secund, laxly or closely 3—many-flowered. *Bract* lanceolate, oblong or ovate, acuminate, acute, obtuse or truncate, herbaceous, often scariose at the apex, rarely entirely scariose, pubescent or glabrous; *bracteoles* free or partially to almost completely united, lanceolate, acuminate, usually herbaceous with hyaline margins, otherwise resembling the bract. *Flowers* actinomorphic or zygomorphic, often bilabiate with the dorsal lobe free, slightly to distinctly longer than the others, and the upper lateral lobes very shortly united with the three lower in a lip; *perianth tube* short or long, straight or curved, usually cylindrical to the middle becoming infundibuliform above, sometimes cylindrical almost to the throat; *lobes* equal, subequal or unequal and dissimilar, obovate, oblong, oblanceolate or oblong- or oblanceolate-unguiculate, mostly obtuse or subacute, the outer usually mucronate or mucronulate. *Stamens* inserted near the throat of the tube, erect and symmetrically arranged round the style or unilateral, contiguous and suberect to arcuate; *filaments* usually longer than the anthers; *anthers* basifixed, linear-lanceolate or occasionally sagittate. *Ovary* fairly small, oblong to subglobose, glabrous, hispidulous, villous or sericeous; *style* extruded from the perianth tube (except in one species), usually reaching to middle of anthers or above them, the branches short, usually narrow, conduplicate, oblanceolate or spathulate, rarely with fairly large orbicular stigmas or flattened and crenulate. *Capsule* oblong to globose, glabrous or pubescent; *seeds* small, few to several in each carpel, usually angled by pressure.

KEY TO THE SECTIONS

1. Bracts and bracteoles entirely scariose, pale brown or colourless with brown flecks .. .. 3. *Scariosae*

1. Bracts and bracteoles partly or entirely green and herbaceous, rarely brown at time of flowering but if so not scariose.

  2. Leaves terete; perianth tube very long and slender, cylindrical nearly to the top .. .. 4. *Teretifoliae*

  2. Leaves not terete; perianth tube short or long.

    3. Flowers actinomorphic or with equal or subequal perianth lobes, sometimes the 3 outer slightly narrower and shorter than the 3 inner, the lobes not arising obliquely from the perianth tube (occasionally very slightly so in *B. pulchra*); ovary villous or sericeous .. 1. *Acaste*

    3. Flowers zygomorphic, often bilabiate, the dorsal perianth lobe usually slightly or much longer than the 3 lower, or the lobes occasionally equal or subequal but if so then the ovary glabrous.

      4. Perianth tube up to 1·5 cm. long but usually less; lobes unguiculate, the dorsal with a long narrow claw, widely separated from the others and much longer, at first arcuate, later reflexed; bracteoles partly united; ovary glabrous except in *B. unguiculata* .. .. 5. *Exohebeoides*

      4. Perianth lobes and tube variable, the tube from 1—7 cm. long, sometimes 1—1·5 cm. long and the dorsal lobe widely separated from the others and more or less unguiculate but if so then the claw fairly short and broad and the bracteoles free .. 2. *Babiana*

KEY TO THE SECTION *ACASTE*

1. Flowers yellow or creamy yellow (same when dried).

  2. Flowers with a purplish centre; lobes obovate, 3—5 cm. long .. .. 3. *pygmaea*

  2. Flowers without a contrasting colour at the centre; lobes more or less oblong, 2—2·5 cm. long .. .. .. 8. *stricta* var. *sulphurea*

1. Flowers not yellow or cream coloured.

3. Perianth tube straight, rarely slightly curved near the throat but if so then the tube longer than the lobes; flowers not twisted to face the stem apex.

4. Anthers lanceolate or linear-lanceolate, rarely more than 1·5 mm. wide.

5. Perianth lobes broadly unguiculate and scarlet below, the blade ovate or suborbicular, blue; stigmas large and flattened with irregular crenulate margins .. .. 6. *rubrocyanea*

5. Perianth lobes sometimes dark red at the base but not as above; stigmas small, nearly always conduplicate.

6. Leaves 8—10 to a plant; bracts entirely green .. 5. *foliosa*

6. Leaves 4—8 to a plant, rarely more; bracts brown or ferruginous at the apex.

7. Filaments well exserted from the perianth tube, 3 mm. or more longer than the anthers .. 8. *stricta*

7. Filaments shortly exserted from the perianth tube, as long as the anthers or 1—2 mm. longer.

8. Perianth lobes obovate or suborbicular, 1·4—2 cm. wide .. .. 2. *blanda*

8. Perianth lobes oblong or obovate-oblong, 0·6—1·3 cm. wide.

9. Perianth tube very slender or filiform nearly to the top, 1·8—3 cm. long, with the upper 3—5 mm. infundibuliform .. .. 1. *villosula*

9. Perianth tube not very slender, up to 2 cm. long with the upper third or half infundibuliform.

10. Bracts 2 cm. or more long, with somewhat conspicuous bifid ferruginous tips; anthers nearly always white or yellow 4. *leipoldtii*

10. Bracts up to 1·5 cm. long, very rarely more, the apex not as above; anthers purple .. .. 8. *stricta*

4. Anthers sagittate, 2—4 mm. wide.

11. Perianth tube very slender or filiform to within 1—2 mm. of the throat then abruptly expanded .. 7. *villosa*

11. Perianth tube slightly or distinctly expanded above the middle, the upper half or third broadly or narrowly infundibuliform.

12. Perianth lobes slightly or much longer than the tube; stigmas small, conduplicate, not or only slightly overtopping the anthers .. .. 8. *stricta*

12. Perianth lobes nearly always shorter than the tube; stigmas fairly large, orbicular and sometimes flattened, usually projecting well above the anthers .. .. 9. *purpurea*

3. Perianth tube usually slightly or distinctly curved at the base or near the middle, much shorter than the lobes; flowers twisted to face the stem apex .. .. 10. *pulchra*

Key to the Section *BABIANA*

1. Perianth tube almost always shorter than the lobes, usually less than 2·5 cm. long, rarely slightly more but if so then the lobes longer.

2. Leaves conspicuously undulate or crisped .. .. 28. *crispa*

2. Leaves not or rarely very slightly undulate.

3. Leaves spirally twisted from the base or above the middle.

4. Leaves subglabrous or minutely pubescent.. .. 21. *scabrifolia*

4. Leaves covered with long fine silky hairs.

5. Leaves 0·8—1·2 cm. wide; bract and bracteoles villous all over .. .. 30. *torta*

5. Leaves 1·5—4 mm. wide; bract and bracteoles glabrous or glabrous below and pubescent near the apex.

6. Leaves spreading from the base, more or less falcate, with a slight twist; bracts pubescent near the apex .. .. 24. *minuta*

6. Leaves not as above, usually much curled and twisted; bracts glabrous .. .. .. 25. *namaquensis*

3. Leaves not twisted.

7. Leaves glabrous, the blade short and more or less horizontal, arising almost at a right angle to the petiole .. .. 33. *horizontalis*

7. Leaves variously pubescent, rarely glabrous or subglabrous but if so then not as above.

8. Leaves, or at least the lower ones, short, oblong, oblong-lanceolate or obliquely ovate, abruptly contracted to an acute or obtuse apex.

9. Leaf blade arising nearly at a right angle to the petiole and spreading more or less horizontally with the apex upcurved; ovary villous or sericeous .. .. 23. *salteri*

9. Leaves not as above; ovary glabrous or puberulous on the nerves.

10. Bracteoles entirely herbaceous, united almost to the apex .. .. 26. *nana*

10. Bracteoles with hyaline margins, free or occasionally united at the base .. .. 21. *scabrifolia*

8. Leaves linear, lanceolate or ensiform, acute or acuminate.

11. Bracts tricuspidate, mostly brown and more or less lacerated at time of flowering .. .. 14. *secunda*

11. Bracts not tricuspidate, more or less green and pubescent at time of flowering, not lacerated.

12. Bracteoles free or occasionally with the hyaline margins united at the base.

13. Ovary thinly or densely villous or sericeous.

14. Bracts and flowers small, the bracts about 1 cm. long or less and flowers 2·5—3 cm. long .. .. 11. *lineolata*

14. Bracts and flowers slightly or much larger than above, the bract rarely less than 1·5 cm. long and flowers 3·5 cm. long or more.

15. Dorsal perianth lobe only slightly longer than the 3 lower and not very widely separated from the upper lateral lobes.

16. Perianth lobes as long as the tube or slightly longer, rarely slightly shorter but if so then the leaves more than 1 cm. wide .. .. 12. *plicata*

16. Perianth lobes shorter than the tube, rarely as long as the tube but if so then the leaves not more than 5 mm. wide .. .. .. 13. *patersoniae*

15. Dorsal perianth lobe nearly always markedly longer than the 3 lower and widely separated from the upper lateral lobes.

17. Leaves with slightly thickened fairly prominent margins .. .. 22. *klaverensis*

17. Leaf margins not at all thickened or prominent.

18. Leaves laxly or fairly firmly plicate; inner perianth lobes widest near the apex; ovary densely villous or sericeous.

19. Leaves less than 5 mm. wide 15. *mucronata* var. *minor*

19. Leaves 1 cm. or more wide, rarely slightly less.

20. Flowers yellow, fragrant; perianth tube 1—1·4 cm. long; outer lobes mucronulate or very shortly mucronate .. .. 16. *odorata*

20. Flowers with 3 upper perianth lobes mauve and 3 lower yellow and mauve, scentless; perianth tube 1·5—2·5 cm. long; outer lobes sometimes conspicuously mucronate .. .. .. 15. *mucronata*

18. Leaves not or scarcely plicate; inner perianth lobes widest at or near the middle; ovary thinly villous, sometimes only on the nerves .. .. 21. *scabrifolia*

13. Ovary glabrous or sometimes puberulous on the nerves.

21. Corm with reticulate fibrous tunics; neck wanting or if present then thin or somewhat sparse and rarely entirely enclosing the stem below ground.

22. Leaf blade arising very obliquely, not plicate, 1—2 cm. wide; stem extending well above ground with a fairly lax spike .. .. .. 20. *obliqua*

22. Leaf blade not arising very obliquely, nearly always more or less plicate, 0·3—1 cm. wide; stem usually very short, the spike compact and usually borne just above ground .. .. 19. *ambigua*

21. Corm tunics not or scarcely reticulate, often somewhat matted, with a well developed neck completely enclosing the stem below ground.

23. Inner perianth lobes widest at or near the apex .. .. 17. *patula*

23. Inner perianth lobes widest at or near the middle.

24. Bracts with conspicuous ferruginous tips; stamens unequal in length; stigmas large, more or less orbicular and flattened .. .. .. 18. *montana*

24. Bracts not noticeably ferruginous at the apex; stamens equal; stigmas small, conduplicate, spathulate or oblanceolate .. .. .. 21. *scabrifolia*

12. Bracteoles united to or above the middle.

25. Lower lateral perianth lobes auriculate near the base .. .. 32. *auriculata*

25. Lower lateral perianth lobes not auriculate.

26. Corm tunics without a neck or rarely with a short and somewhat sparse neck which does not enclose the whole stem below ground.

27. Bracteoles with hyaline margins; perianth lobes very unequal, the dorsal 5—10 mm. longer than the 3 lower .. .. 19. *ambigua*

27. Margins of bracteoles not hyaline; perianth lobes subequal or slightly unequal, the dorsal not more than 2—4 mm. longer than the 3 lower .. 26. *nana* vars.

26. Corm tunics with a well developed neck enclosing the stem below ground.

28. Flowers yellow .. .. .. 29. *vanzyliae*

28. Flowers not yellow.

29. Leaves very firm, closely plicate and somewhat pungent, velutinous 27. *cedarbergensis*

29. Leaves not as above.

30. Stem extremely short, seldom 1—2 cm. above ground; leaves pubescent or villous, sometimes covered with long and short silky hairs .. .. 24. *minuta*

30. Stem 6 cm. or more above ground; leaves pilose, the hairs very few and widely scattered .. 31. *pilosa*

1. Perianth tube almost always longer than the lobes, sometimes 2·5—3 cm. long but usually longer.

31. Species endemic to Socotra .. .. 34. *socotrana*

31. Species endemic to South Africa, South West Africa and Southern Rhodesia.

32. Leaves more or less truncate with the apex uneven or fairly regularly 2—several-toothed.

33. Perianth tube curved, geniculate just below the throat; flowers bilabiate, the dorsal lobe distinctly longer than the 3 lower .. .. 47. *pubescens*

33. Perianth tube straight or sometimes curved but not geniculate; flowers not bilabiate, the lobes subequal or the 3 lower slightly shorter than the dorsal.

34. Perianth tube infundibuliform towards the throat; lobes obtuse, the 3 upper slightly longer than the 3 lower; stamens with filaments about 1·5 cm. long, well exserted from the perianth tube .. .. 40. *truncata*

34. Perianth tube cylindrical throughout; lobes acute or subacute; stamens with filaments not more than 7 mm. long, shortly exserted from the perianth tube .. .. 38. *flabellifolia*

32. Leaves subacute, acute or acuminate.

35. Leaves glabrous, rigid, pungent, with thick stramineous veins and margins .. .. .. 44. *dregei*

35. Leaves not as above, variously pubescent, rarely subglabrous but if so then not rigid or strongly nerved.

36. Stem reaching very shortly to well above ground level, the flowers arising above the ground surface.

37. Flowers yellow .. .. 29. *vanzyliae*

37. Flowers not yellow.
38. Flowers white, cream or pinkish with small red marks on the lower lobes; perianth tube 6 cm. or more long; lobes unguiculate or subunguiculate . . . . 51. *tubulosa*
38. Flowers various shades of blue, purple or magenta (rarely white but if so not marked with red and the perianth tube less than 4 cm. long); perianth tube usually less than 6 cm. long, if longer then the lobes not unguiculate or subunguiculate.
39. Ovary villous or sericeous.
40. Stem very short, decumbent; style branches 1 cm. or more long . . . . 46. *geniculata*
40. Stem erect, short or long; style branches not more than 5 mm. long.
41. Perianth tube geniculate below the throat, 3·5—4·5 cm. long . . . . 43. *ecklonii*
41. Perianth tube with a slight curve below the throat but not geniculate, rarely up to 3·5 cm. long.
42. Perianth lobes shorter than the tube or rarely as long but if so then the leaves not more than 5 mm. wide . . . . 13. *patersoniae*
42. Perianth lobes as long as the tube or slightly longer, rarely slightly shorter but if so then the leaves more than 1 cm. wide.
43. Perianth lobes more or less unguiculate, the dorsal widely separated from the others and more than 5 mm. longer than the 3 lower . . . . . . 15. *mucronata* var. *longituba*
43. Perianth lobes not unguiculate, the dorsal not or only slightly separated from the others and not more than 1—3 mm. longer than the 3 lower . . . . . . 12. *plicata*
39. Ovary glabrous or rarely slightly hispidulous on the nerves.
44. Bracteoles free . . . . 35. *fourcadei*
44. Bracteoles united.
45. Leaves linear-lanceolate with a long recurved spirally twisted tip; bracts glabrous . . . . 42. *longicollis*
45. Leaves linear-lanceolate to more or less oblong, the tip not twisted or recurved; bracts not glabrous.
46. Leaves with somewhat conspicuous fairly wide petioles extending well above the ground and enclosing the stem . . . . 39. *pauciflora*
46. Leaves not with conspicuous wide petioles above ground, the petioles when present either very short or slender.
47. Perianth tube geniculate shortly below the throat . . . . . . 45. *curviscapa*
47. Perianth tube straight or with a slight curve shortly below the throat but not geniculate.

48. Perianth tube evenly and very slightly widened from base to throat, usually straight .. 36. *sambucina*

48. Perianth tube either narrowly cylindrical nearly to the top with a slight curve shortly below the throat and slightly widened from there up, or slender below and infundibuliform towards the throat.

49. Perianth tube twice as long as the lobes or at least 2 cm. longer.

50. Lobes acute to acuminate, subequal or the dorsal not more than 2—3 mm. longer than the 3 lower; anthers 7—9 mm. long .. 37. *framesii*

50. Lobes obtuse or subacute, unequal, the dorsal 4—5 mm. longer than the 3 lower; anthers 4—6 mm. long .. .. .. 45. *curviscapa*

49. Perianth tube slightly shorter than the lobes or up to 1 cm. longer.

51. Leaves more or less oblong or oblong-lanceolate, subacute .. .. .. 39. *pauciflora*

51. Leaves lanceolate or linear-lanceolate, acute or acuminate.

52. Inner perianth lobes oblong or obovate-oblong 29. *vanzyliae*

52. Inner and outer perianth lobes narrowly elliptic or lanceolate .. 41. *attenuata*

36. Stem entirely subterranean, the flowers arising below the ground surface.

53. Leaves falcate, firm and somewhat pungent .. 49. *falcata*

53. Leaves erect, suberect or decumbent but not firm and falcate.

54. Flowers yellowish; perianth lobes recurved at or above the middle, with long tapering acuminate tips.. .. .. 50. *flavida*

54. Flowers not yellow; perianth lobes obtuse or acute, rarely slightly acuminate, the outer or all mucronate .. .. .. 48. *hypogea*

Key to the Section *SCARIOSAE*

1. Perianth tube about 2 cm. long, shorter than the lobes .. 52. *scariosa*

1. Perianth tube 3·5—4·5 cm. long, much longer than the lobes .. .. 53. *spathacea*

Section *TERETIFOLIAE*

Only 1 species .. .. 54. *brachystachys*

Key to the Section *EXOHEBEOIDES*

1. Leaves lanceolate or ensiform, not twisted or undulate .. 55. *stenomera*

1. Leaves variously twisted or undulate, rarely flat but if so then linear.

2. Anthers coherent .. .. 56. *sinuata*
2. Anthers not coherent.
3. Leaves undulate with deeply wavy margins .. 57. *striata*
3. Leaf margins not or only slightly undulate or crisped.
4. Leaves linear or linear-lanceolate, up to 5 mm. wide but usually less.
5. Flowers yellow; ovary pubescent or hispidulous.. 58. *unguiculata*
5. Flowers not yellow; ovary glabrous.
6. Leaves, or at least the outer ones, spreading or recurved above the middle; lower lateral perianth lobes shortly clawed, the blade auriculate at the base .. .. 59. *fimbriata*
6. Leaves erect; lower lateral perianth lobes with a long claw and trilobate blade .. .. 61. *lobata*
4. Leaves lanceolate to ovate-lanceolate, 0·5—1 cm. or more wide.
7. Bracts not less than 1·2 cm. long .. .. 57. *striata* var. *planifolia*
7. Bracts very small, not more than 7 mm. long .. 60. *tritonioides*

Section Acaste (Salisb.) Benth. & Hook. Gen. Pl. 3: 707 (1883). Acaste Salisb., Trans. Hort. Soc. 1: 322 (1812), pro gen. Subgen. Acaste (Salisb.) Baker, Journ. Linn. Soc. 16: 166 (1877), Handbk. Irid. 180 (1892) and Fl. Cap. 6: 107 (1896).

Leaves lanceolate or ensiform, laxly or firmly plicate, pubescent. Bract and bracteoles herbaceous, pubescent, the bracteoles free except in *B. pygmaea* and sometimes *B. blanda.* Flowers actinomorphic or nearly so, with equal or subequal perianth lobes, sometimes the 3 outer slightly narrower and shorter than the 3 inner. Stamens symmetrically arranged round the style or unilateral and occasionally subarcuate. Ovary villous or sericeous.

Type species: *B. rubrocyanea* (Jacq.) Ker.

1. **B. villosula** (Gmel.) Ker ex Steud. (Plate 2), Nom. ed. I, 371 (1821); ed. II, 1: 176 (1840). *Ixia villosula* Gmel. Syst. 1: 110 (1796). *I. villosa* Jacq. Ic. t. 284 (1786–93) and Coll. 3: 267 (1789); non Ait. (1789); Willd. Sp. 1: 198 (1797), pro parte; Lam. Illust. 1: 110 (1791). *Gladiolus villosulus* (Gmel.) Roem. & Schult. Syst. 1: 444 (1817). *Ixia plicata* L. Amoen. Acad. 4: 300 (1759), excl. syn. *Gladiolus plicatus* L. Sp. Pl. ed. II, 1: 53 (1762), excl. ref. Mill. Ic.; Vahl Enum. 2: 116 (1806), pro parte. *Ixia coerulescens* Pers. Syn. 1: 48 (1805). *Babiana obtusifolia* Ker in Konig & Sims Ann. 1: 234 (1805). *B. stricta* (Ait.) Ker var. *obtusifolia* (Ker) Baker, Journ. Linn. Soc. 16: 166 (1877), Handbk. Irid. 184 (1892) and Fl. Cap. 6: 113 (1896). *B. disticha* Eckl. Top. Verz. 31 (1827); non Ker (1803). *B. villosa* Eckl. l.c. 32. *B. orthosantha* Baker, Kew Bull. 1906, 27. *B. hiemalis* L. Bol., S.A. Gard. & Country Life 22: 243 (1932); Lewis in Adamson & Salter Fl. Cap. Pen. 244 (1950).

Corm ovoid or globose, 2—3·5 cm. diam.; tunics usually thick and matted, of brown or reddish brown fairly fine fibres, with a neck 4—6 cm. or sometimes to 9 cm. long. *Leaves* 3—5, lanceolate or ensiform, acute or acuminate, patent or more often ascending or suberect, 4—14 cm. long, 0·4—1·4 cm. wide, plicate, sparsely to fairly densely pubescent. *Stem* erect, velutinous, usually 1—5 cm. high and simple, if longer then sometimes branched. *Spike* distichous, closely 2—8-flowered, usually 2—4. *Bract* lanceolate or ovate-lanceolate, acute, 2—4 cm. long, herbaceous, pubescent, the apex scariose and ferruginous; *bracteoles* free, lanceolate, acuminate, 1·5—2 cm. long, herbaceous with narrow hyaline margins, the apex ferruginous. *Flowers* actinomorphic, pale blue or mauve, rarely pinkish mauve, with a small white star at the centre; *perianth tube* straight, 1·8—2·5 cm. long (occasionally to 3 cm.), very slender or filiform with the upper 3—5 mm. infundibuliform; *lobes* equal or the outer slightly longer than inner, oblong or obovate-oblong, obtuse or subacute, 2—3 cm. long, 0·8—1·3 cm. wide, the outer usually mucronulate. *Stamens* shortly exserted from the perianth tube, erect, symmetrically arranged round the style; filaments 4—8 mm. long; anthers 5—8 mm. long, 1—1·5 mm. wide. *Ovary* ovoid or rotund, 4—5 mm. long, villous or sericeous above the base; style not reaching above middle of anthers, the branches filiform, about 4 mm. long, with very small cuneate or obcordate conduplicate stigmas.

Common in sandy soil on flats and lower mountain slopes on the Cape Peninsula and in neighbouring districts, flowering during the winter months.

TYPE. Jacquin Ic. t. 284.

Flowering period. May—July.

MALMESBURY. West of Paardeberg: *Salter* 3377, 3554. Zwartland, between Riebeckskasteel and Paardeberg: *Zeyher* 1614.

CAPE. Between Vissershok and Mamre road: *Leighton* 1803. Fifteen miles N. of Cape Town on Malmesbury road: *Lewis* 100. Table Mountain: *Ecklon* 124 b (*B. disticha* Eckl.); *Rehmann* 1202. Table Mt. and Devil's Peak: *Drege*. Devil's Peak: *MacOwan* 272; *Rehmann* 942; *Burchell* 8489. Lions Head: *Pappe*. Cape Town: *Zeyher*; *Rehmann* 1435; *Marloth* 576. Camps Bay: *Dod* 1197; *Esterhuysen* 12844; *Marloth* 5611; *Thode* A 160, 161; *Barker* 2424, 4032; *Steyn* 186. Camp Ground, Rondebosch: *Schlechter* 825; *Dod* 589. Rondebosch Common: *Isaac* (52894 in S. Af. Mus.); *Barker* 449, 1562; *Steyn* 82. Near Rondebosch: *Bolus* 4727. Cape Flats: *Rogers* 15536; *Humbert* 9369. Flats near Athlone: *Arbuthnot* (N.B.G. 1207/33 in Bol. Herb.). Flats near Mowbray: *Moss* 11416. Claremont: *Dod* 1255. Kenilworth Race Course: *Salter* 7363; *Barker* 1561. Flats near Wynberg: *Hutchinson* 6; *Gamble* 22049. Wynberg Hill: *L. Bolus* (B.H. 20151, type of *B. hiemalis* in Herb. Bol.). Constantia: *Wilms* 3687; *Prior*. Between

Cape Town and Simons Bay: *Burchell* 8553. Tokai: *Salter* 7367. Pollsmoor: *Barker* 4584. Muizenberg: *Galpin* 4706. Fish Hoek: *Otley* (11513 in Herb. Moss). Kommetjie: *Lewis* 25; *Barker* 448. Simonstown: *Jameson; Krause* 4370. Schusters Kraal: *Compton* 13343. Above Smitswinkel Bay: *Phillips* (26044 in S. Af. Mus.); *Martin* 4627. Near Cape Point: *Rogers* 27259.

PAARL. French Hoek Pass: *Bond* 358; *Esterhuysen* 2796.

STELLENBOSCH. Stellenboschberg: *Strey* 581. Stellenbosch: *Carter.*

SOMERSET WEST. Somerset West: *Creasy.* Sir Lowrys Pass: *Schlechter* 1145. Somerset West road: *Duthie* 863.

WITHOUT LOCALITY. *Linnaeus* (*Gladiolus plicatus* L.); *Sparrman* 57, 85; *Jussieu* 3646; *Prior; Oldenburg* 1414; *Bowie* 6; *Sieber* 128, 233; *Ecklon* 126; *Sonnerat* (in Herb. Jussieu); *Drege* 8383; *Penther* 941 (type of *Babiana orthosantha* in Kew Herb., said to come from Olifants R., Clanwilliam).

The plants are variable in size, sometimes dwarf, the stem only 1—2 cm. high and the leaves spreading, or taller with the stem several centimetres high and occasionally branched, and suberect leaves. The flowers are delicate and somewhat fugacious and very often become colourless or greyish when dried. It is one of the commonest species on the Cape Peninsula and in neighbouring districts and has been the subject of considerable confusion, as is evident from the above synonymy. It was named *Gladiolus plicatus* by Linnaeus in 1762, and an account of the species is given in the note on *G. plicatus* L. and *Babiana plicata* Ker in the introductory chapter.

There is an error about the locality and flowering time of *Penther* 941, the type of *B. orthosantha* Baker, given as Olifants River, Clanwilliam, October. The species does not occur so far north, nor has it ever been found in flower later than the first week in August.

2. **B. blanda** (L. Bol.) Lewis stat. nov. (Plate 3). *B. macrantha* MacO. var. *blanda* L. Bol., S.A. Gard. & Country Life 22: 276 (1932).

Cormus ovoideus vel subglobosus, 1·2—2 cm. diam., tunicis e fibris tenuibus vel sat robustis rubido-brunneis in collo 4—8 cm. longo productis, compositis. *Caulis* fere brevissimus, erectus, velutinus, simplex vel interdum ramo brevissimo. *Folia* 5—6 disticha, plerumque patentia, petiolis villosis supra terram per 0·5—3·5 cm. productis; lamina lanceolata vel plus minusve oblique oblongo-lanceolata, acuta, 3—9 cm. longa, 0·6—1·2 cm. lata, plicata, pubescens. *Spica* disticha, sat dense 3—6-flora. *Bractea* lanceolata, 2·4—4·4 cm. longa, herbacea, pubescens, apice scariosa, ferruginosa, acuta, truncata vel bifida; *bracteolae* quam bractea breviores, lanceolatae, acuminatae, marginibus latis scariosis glabris, liberae vel partim coalitae interdum ad medium vel parum ultra. *Flores*

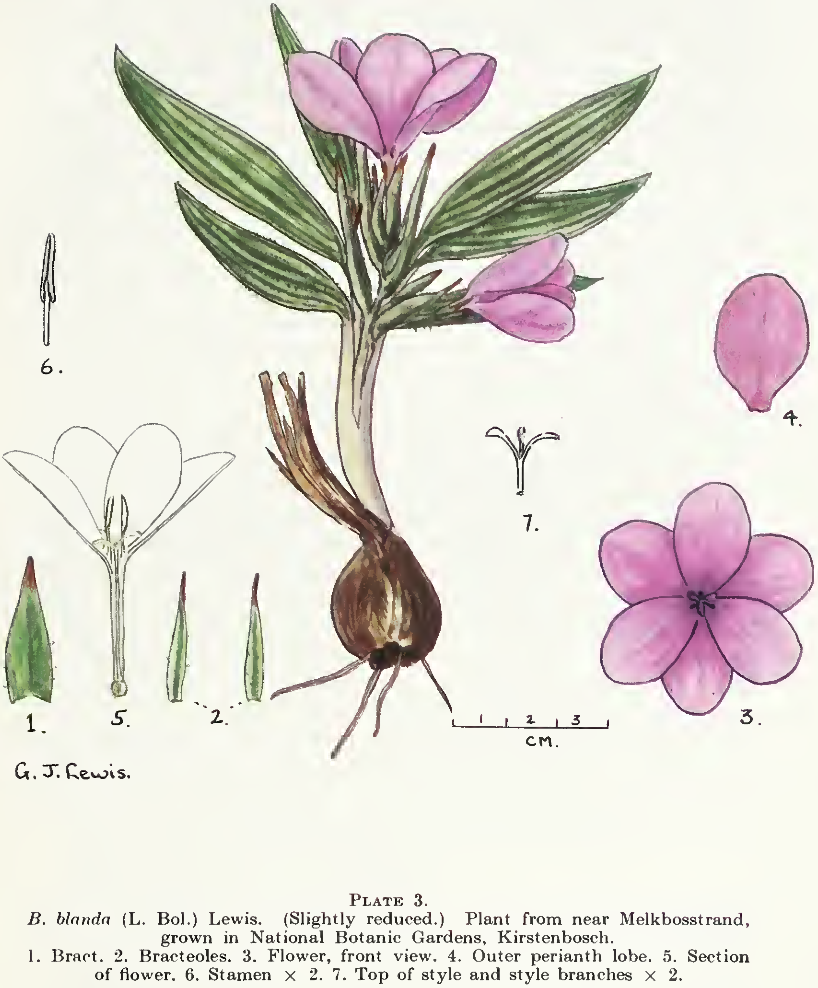

PLATE 3.
B. blanda (L. Bol.) Lewis. (Slightly reduced.) Plant from near Melkbosstrand, grown in National Botanic Gardens, Kirstenbosch.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Outer perianth lobe. 5. Section of flower. 6. Stamen × 2. 7. Top of style and style branches × 2.

regulares, rosei, interdum ad medium macula alba notati; *perianthii tubus* rectus, 2—2·7 cm. longus, filiformi-cylindricus superne per 3—4 mm. infundibuliformis; *segmenta* aequalia, obovata vel suborbicularia, obtusa vel interdum retusa, 2·3—3·3 cm. longa, 1·4—2 cm. lata, exteriora mucronulata et interdum nervo medio extrinsecus ciliato. *Stamina* breviter ex tubo perianthii exserta, aequilateralia filamentis rectis 5—8 mm. longis, antheris 7—9 mm. longis et 1—1·5 mm. latis. *Ovarium* rotundum, 2·5—3 mm. longum, supra basin sericeum; stylus ex tubo perianthii non vel brevissime exsertus, raro ultra basin antherarum attingens, ramis spathulatis conduplicatis 3—4 mm. longis.

Corm ovoid or subglobose, 1·2—2 cm. diam.; tunics of fine to fairly coarse reddish brown fibres, with a neck usually 4—8 cm. long. *Stem* very short, elongating in bushes or shade, erect, velutinous, simple or occasionally with 1 short branch. *Leaves* 5—6, distichous, usually patent, with villous petioles extending 0·5—3·5 cm. above ground, the blade lanceolate or somewhat obliquely oblong-lanceolate, acute, 3—9 cm. long, 0·6—1·2 cm. wide, plicate, pubescent. *Spike* distichous, fairly closely 3—6-flowered. *Bract* lanceolate, 2·4—4·4 cm. long, herbaceous, pubescent, the apex scariose and ferruginous, acute, truncate or bifid; *bracteoles* shorter than the bract, lanceolate, acuminate, with wide scariose glabrous margins, free or partially united, sometimes to the middle or shortly above. *Flowers* actinomorphic, bright rosy pink, sometimes marked with white at the centre; *perianth tube* straight, 2—2·7 cm. long, very slender and cylindrical with the upper 3—4 mm. infundibuliform; *lobes* equal, obovate or suborbicular, obtuse or sometimes retuse, 2·3—3·3 cm. long, 1·4—2 cm. wide, the outer mucronulate and occasionally ciliate on the medial vein outside. *Stamens* very shortly exserted from the perianth tube, symmetrically arranged round the style with erect filaments 5—8 mm. long; anthers 7—9 mm. long, 1—1·5 mm. wide. *Ovary* rotund, 2·5—3 mm. long, sericeous above the base; style not or very shortly exserted from the perianth tube, seldom reaching above base of anthers, with spathulate conduplicate branches 3—4 mm. long.

Sandy flats in the Malmesbury, Bellville, Paarl and Cape Divisions.

TYPE. *Eaton*, N.B.G. 1110/26, in the Bolus Herbarium.

Flowering period. August—September.

MALMESBURY. Darling: *Esterhuysen*, N.B.G. 1603/37; *Bachmann* 522. Near Mamre: *L. Bolus* (21249 in Herb. Bol.); *Davis* (59865 in S. Af. Mus.).

BELLVILLE. Near Melkbosstrand: *Eaton*, N.B.G. 1110/26. Between Melkbosstrand and Mamre: *Salter* 1241. Eighteen miles from Cape Town on Melkbosstrand road: *Lewis* 1064. Mamre road: *Thorne* (53124 in S. Af. Mus.); *Leighton* 566, 1806; *Barker* 445, 446, 447, 4099; *Lewis* 101;

Johnson 177. Between Paarden Island, Blauberg and Tygerberg: *Drege* 8385.

Paarl. Agter Paarl: *Middlemost*, N.B.G. 1424/37.

Cape. Flats S. of Koeberg: *Pillans.*

Dr. L. Bolus placed this as a variety of *Babiana macrantha* (=*B. pygmaea*) but in my opinion it is nearer *B. villosula* and would be better treated as a separate species. It is allied to both *B. pygmaea* and *B. villosula* and distinguished from the latter mainly by the larger flowers with obovate or suborbicular perianth lobes, and the style branches and stigmas, those of *B. villosula* being filiform with very small stigmas. From *B. pygmaea* it differs in having somewhat smaller flowers with very different colouring, shorter perianth lobes and the tube comparatively longer, slightly longer filaments and shorter anthers which are always shortly exserted from the throat of the perianth tube, as well as slightly longer and narrower style branches and stigmas.

A number of hybrids between *B. blanda* and *B. villosula* have been observed in the field and there is now no doubt that the plant described as *B. lata* by myself in 1932 is of hybrid origin. The bracteoles are sometimes partially united, sometimes free, and the flowers vary in size and colouring, sometimes pink or blue but more often motley, with the upper half of the lobes pale blue and the lower half pink, with or without a white star at the centre, or the flowers pale mauve with a small or fairly large pink star at the centre. The following are hybrids:—

Paarl. Achterpaarl road, near Paarl: *Lewis*, N.B.G. 1685/32.

Bellville. Three miles E. of Melkbosstrand: *Andreae* 1125. Melkbosstrand road, 18 miles from Cape Town: *Lewis* 105. About 10 miles N.E. of Phesante Kraal: *Salter* 3439; *van Niekerk* 156. Between Durbanville and Paarl: *Lewis*, N.B.G. 1684/32.

Cape. Fifteen to 16 miles N. of Cape Town on Malmesbury road: *Leipoldt* (55690 in S. Af. Mus.); *Compton* 18111. Near Killarney: *Barker* 452.

3. **B. pygmaea** (Burm. f.) N. E. Br. (Plate 4), Kew Bull. 1929, 136; non Baker (1877). *Ixia pigmaea* Burm. f. Prodr. 1 (1768). *Babiana macrantha* MacOwan, Journ. Linn. Soc. 25: 394 (1890); Baker Handbk. Irid. 184 (1892) and Fl. Cap. 6: 113 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895).

Corm ovoid or globose, 1·3—2·5 cm. diam.; tunics of reticulate pale brown or reddish brown fibres, with a neck 3·5—10 cm. long. *Stem* erect, 2—6 cm. or sometimes to 15 cm. high, velutinous or puberulous, rarely branched. *Leaves* 4—6, distichous, the petiole extending 1—5 cm. above ground, villous, the blade arising obliquely, patent, obliquely lanceolate or ensiform, acute, 5—12 cm. long, 0·6—2·2 cm. wide (usually 1—1·5 cm.), laxly plicate, pubescent. *Spike* distichous, laxly 2—5-flowered. *Bract* lanceolate, 3—3·6 cm. long, herbaceous, pubescent, the apex scariose, ferruginous, acute, truncate or emarginate; *bracteoles* slightly shorter than bract, united nearly to the apex or only the lower third, bicarinate, the apex and margins scariose. *Flowers* actinomorphic, large (6—9 cm. in diam.), sulphur-yellow with a purple-maroon stain at the centre, the outer lobes often tinged with purple outside; *perianth tube* straight, 1·5—2·5 cm. long, rarely up to 3 cm., slender, cylindrical, expanded to a short broad funnel at the throat; lobes obovate, subequal, patent, 3—5 cm. long, 1·7—3 cm. wide near the top, the outer with a short recurved mucro just below the apex. *Stamens* symmetrically arranged round the style, with erect filaments 3—6 mm. long, not or scarcely exserted from the perianth tube; anthers erect, 0·8—1 cm. long, 1—1·5 mm. wide. *Ovary* ovoid or rotund, 2—3 mm. long, villous or puberulous in the upper half or only on the nerves; style very shortly exserted from perianth tube or occasionally reaching to top of anthers, the branches 2·5—3 mm. long with wide orbicular ciliate stigmas.

Local on sandy flats near Darling and Hopefield in the Malmesbury and Hopefield Divisions.

TYPE. *Burmann* in the Herb. Delessert, Geneva.

Flowering period. August—September.

HOPEFIELD. Near Hopefield: *Bachmann* 184; *Schlechter* 5299.

MALMESBURY. Near Darling: *MacOwan*, H.N.A.Af. 811 (type of *B. macrantha*, in S. Af. Mus.); *Marloth* 7498; *Lewis* 1053; *Leighton* 635; *Compton* 15960; *Rycroft* 1980; *Davison*, N.B.G. 2255/16. Near Mamre Road Station: *Salter* 6867. Malmesbury: *Flanagan* 1741; *Dummer* 192. Groot Kraal: *Deas*, N.B.G. 2026/16.

WITHOUT LOCALITY. *Burmann; Rogers* 11095.

In an article on the Iridaceae of Burmann's Flora Capensis Prodromus (Kew Bull., 1929), N. E. Brown made the following note on *Ixia pigmaea* Burm.: "This plant is *Babiana macrantha* MacOwan, which must now take the name *B. pygmaea* N. E. Br. Burmann has described the leaves as glabrous but this is not the case, they are pubescent. The plant Baker has mistaken for *I. pigmaea* Burm. and described as *Babiana pygmaea* is *Babiana nana* Spreng". Had Baker seen Burmann's type, which is in good condition, this mistake would not have occurred, as the large size and unusual colouring of the flowers readily distinguish this species from all others.

4. **B. leipoldtii** Lewis sp. nov.

Cormus ovoideus vel subglobosus, 1·5—2·5 cm. diam., tunicis concretis e fibris rubido-brunneis in collo 11—14 cm. longo productis, com-

positis. *Caulis* erectus vel suberectus, leviter flexuosus, 6—15 cm. altus, velutinus, simplex vel ramis 1—2 brevissimis erectis. *Folia* 5—6, disticha, ascendentia vel suberecta, lanceolata, acuta vel acuminata, 4—8 cm. longa, 4—8 mm. lata, plicata, pubescentia. *Spica* disticha, laxe vel sat dense 4—8-flora. *Bractea* lanceolata, 2—3·5 cm. longa, herbacea, pubescens, apice scariosa, ferruginosa et plerumque bidentata, acuta vel acuminata; *bracteolae* quam bractea breviores, liberae vel ad basin coalitae, lanceolatae, acutae vel acuminatae, apice et marginibus scariosis, ferruginosis. *Flores* regulares, lilacini vel violacei, segmentis basin versus interdum macula rubra parva notatis; *perianthii tubus* rectus, 1·5—2 cm. longus, inferne cylindricus, dimidia vel tertia parte superiore infundibuliformi; *segmenta* aequalia, plus minusve oblonga, obtusa, 2·5—3 cm. longa, 0·8—1·3 cm. lata, exteriora mucronata vel mucronulata. *Stamina* erecta, aequilateralia, raro ultra tertiam partem inferiorem segmentorum attingentia, filamentis 7—9 mm. longis et antheris lineari-lanceolatis 6—8 mm. longis, 1—1·5 mm. latis plerumque albis vel luteis. *Ovarium* globosum, circa 3 mm. longum, dimidia parte superiore villosa, inferne glabrum; stylus ad medium antherarum vel infra attingens, ramis filiformibus 4 mm. longis apice stigmatifero parvulo cuneato conduplicato.

Corm ovoid or subglobose, 1·5—2·5 cm. diam.; tunics of matted brown or reddish brown fibres, with a neck 11—14 cm. long. *Stem* erect or suberect, somewhat flexuose, 6—15 cm. high, velutinous, simple or with 1—2 short erect branches. *Leaves* 5—6, distichous, ascending or suberect, lanceolate, acute or acuminate, 4—8 cm. long, 4—8 mm. wide, plicate, pubescent. *Spike* distichous, laxly to fairly closely 4—8-flowered. *Bract* lanceolate, 2—3·5 cm. long, herbaceous, pubescent, the apex scariose, ferruginous and usually bidentate, acute or acuminate; *bracteoles* shorter than the bract, free or united at the base, lanceolate, acute or acuminate, the apex and margins scariose, ferruginous. *Flowers* actinomorphic, mauve-blue or violet coloured, sometimes with a small red spot at the base of the lobes; *perianth tube* straight, 1·5—2 cm. long, cylindrical below, the upper half or third infundibuliform; *lobes* equal, more or less oblong, obtuse, the outer mucronate or mucronulate, 2·5—3 cm. long, 0·8—1·3 cm. wide. *Stamens* erect, symmetrically arranged round the style, seldom reaching more than a third of the way up the perianth lobes; filaments 7—9 mm. long; anthers linear-lanceolate, 6—8 mm. long, 1—1·5 mm. wide, usually white or yellow. *Ovary* globose, about 3 mm. long, the upper half villous, glabrous below; style reaching to middle of anthers or below, the branches filiform, 4 mm. long, with very small cuneate conduplicate stigmas.

Damp sandy flats in the Malmesbury and Bellville Divisions.

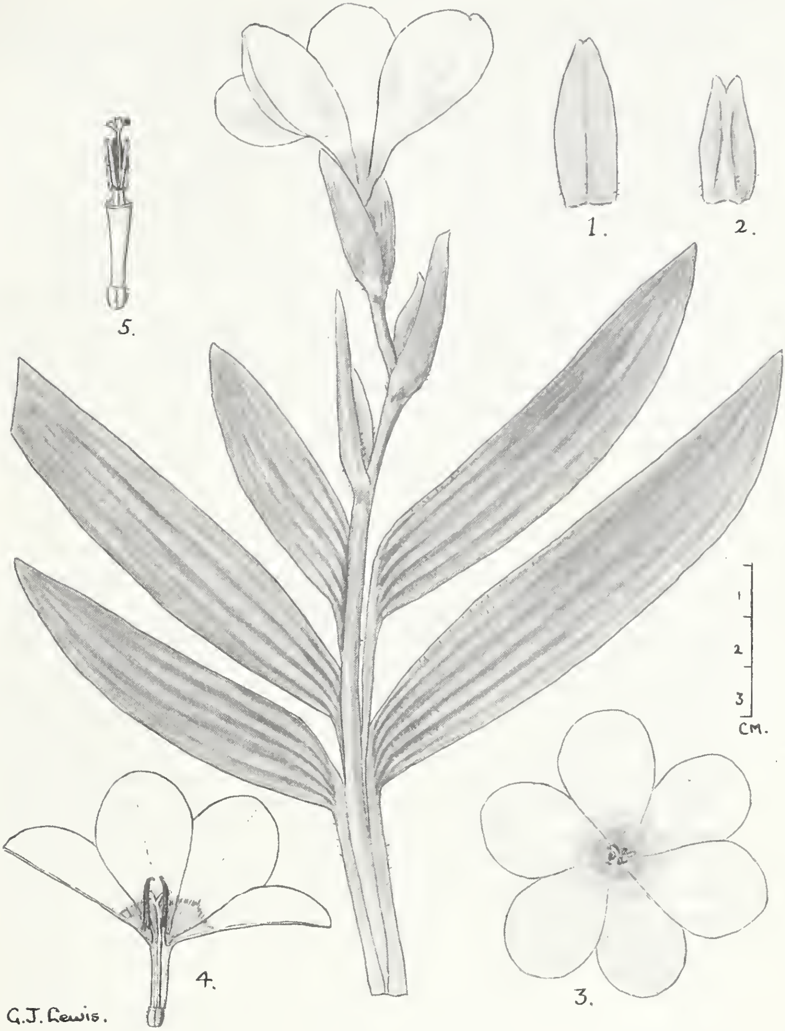

PLATE 4.
B. pygmaea (Burm. f.) N. E. Br. (Slightly reduced.) Plant from near Darling.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower. 5. Flower with perianth lobes removed.

Type. *Leipoldt,* No. 55686 in the South African Museum Herbarium, National Botanic Gardens.

Flowering period. August—September.

Malmesbury. Between Mamre and Darling: *Leipoldt* (55686 in S. Af. Mus.). Six miles N. of Darling on Darling-Hopefield road: *Lewis* 2220. Five miles W. of Mamre Road Station: *Salter* 4671. Near Mamre Road Station: *Salter* (54320 in S. Af. Mus.). Kalabas Kraal: *Barker* 8610. Between Kalabas Kraal and Abbotsdale: *L. Bolus*, N.B.G. 1828/32.

Bellville. Three miles N.E. of Klipheuvel: *Lewis* 4413.

This species is near *Babiana villosula* and *B. stricta* but differs from the former in its more robust habit, more deeply seated corm, longer stem, laxer spike and less fugacious flowers with a slightly shorter and stouter perianth tube. From *B. stricta* it differs in having the corm more deeply seated, the bracts always considerably longer with bidentate scariose tips, and the stamens comparatively shorter, seldom reaching to the middle of the perianth lobes. There are small vittae present at the base of each perianth lobe but these disappear on drying.

5. **B. foliosa** Lewis sp. nov. (Plate 5).

Cormus ovoideus vel subglobosus, 1·5—2 cm. diam., tunicis e fibris tenuibus pallide brunneis reticulatis in collo 3—5 cm. longo productis, compositis. *Caulis* brevissimus, velutinus, simplex vel ramis 1—2 brevissimis. *Folia* 8—10, disticha, ascendentia vel suberecta, lanceolata vel ensiformia, acuta, 4—10 cm. longa, 0·5—1·2 cm. lata, laxe plicata, velutina, flores superantia. *Spica* disticha, dense 3—6-flora. *Bractea* lanceolata, obtusa, subobtusa vel acuta, omnino herbacea, velutina, 2—3 cm. longa; *bracteolae* liberae, lanceolatae, acuminatae, marginibus hyalinis, quam bractea leviter breviores. *Flores* regulares, lilacini, segmentis maculis lacteis notatis; *perianthii tubus* rectus, 2 cm. longus, dimidia parte superiore ad fauces leviter ampliata; *segmenta* oblonga, obtusa, 2—2·4 cm. longa, 0·8—1·2 cm. lata, aequalia vel exteriora quam interiora leviter angustiora, interdum exteriora nervo medio extrinsecus minute ciliato. *Stamina* recta, aequilateralia filamentis circa 1 cm. longis antherisque 5—6 mm. longis et 1 mm. latis. *Ovarium* oblongum vel rotundum, 3 mm. longum, villosum; stylus prope ad basin antherarum attingens, ramis spathulatis conduplicatis 4 mm. longis.

Corm ovoid or subglobose, 1·5—2 cm. diam.; tunics of fine pale brown reticulate fibres, with a neck 3—5 cm. long. *Stem* very short, velutinous, simple or with 1—2 extremely short branches. *Leaves* 8—10, distichous, ascending or suberect, lanceolate or ensiform, acute, 4—10 cm. long, 0·5—1·2 cm. wide, laxly plicate, velutinous, overtopping the flowers. *Spike* distichous, closely 3—6-flowered. *Bract* lanceolate, obtuse, subobtuse or acute, entirely herbaceous, velutinous, 2—3 cm. long; *bracteoles* free, lanceolate, acuminate, with hyaline margins, slightly shorter than the bract. *Flowers* actinomorphic, mauve with cream markings; *perianth tube* straight, 2 cm. long, the upper half slightly widened to the throat; *lobes* oblong, obtuse, equal or the outer slightly narrower than the inner, 2—2·4 cm. long, 0·8—1·2 cm. wide, the outer sometimes minutely ciliate on the medial vein near the apex outside. *Stamens* erect, symmetrically arranged round the style; filaments about 1 cm. long; anthers 5—6 mm. long, 1 mm. wide. *Ovary* oblong or rotund, 3 mm. long, villous; style reaching nearly to base of anthers, with spathulate conduplicate branches 4 mm. long.

Confined to the Caledon Division, near Riviersonderend.

TYPE. *Barker* 7343 in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August.

CALEDON. Riviersonderend: *Barker* 7343.

This species resembles *Babiana villosula* but has nearly twice as many leaves, the bracts entirely green and the perianth tube stouter. It differs from *B. stricta* in having more numerous leaves, a very much shorter stem and the bracts and perianth tube longer.

6. **B. rubrocyanea** (Jacq.) Ker in Konig & Sims Ann. 1: 234 (1805); Spreng. Syst. 1: 156 (1825); Eckl. Top. Verz. 31 (1827); Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895). *Ixia rubrocyanea* Jacq. Ic. t. 285 (1789) and Coll. 3: 268 (1789); Lam. Illustr. 1: 109 (1791); Willd. Sp. 1: 198 (1797); Curtis Bot. Mag. t. 410 (1798). *I. cyanea* Pers. Syn. 1: 48 (1805). *Gladiolus rubrocyaneus* Vahl Enum. 2: 98 (1806); Roem & Schult. Syst. 1: 424 (1817). *Babiana rubrocoerulea* Rchb. Fl. Exot. 1, t. 30 (1834); Pritz. Ind. Ic. 134 (1866). *Ixia villosa* Schneevogt. Ic. t. 16 (1792). *I. africana* Hornem. Cat. Hort. Havn. 68 (1815); Van Hazen. Cat. t. 2 (1759). *Acaste venusta* Salisb., Trans. Hort. Soc. 1: 322 (1812). *Babiana stricta* (Ait.) Ker var. *rubrocyanea* (Ker) Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 184 (1892) and Fl. Cap. 6: 113 (1896).

Corm ovoid or subglobose, 1·5—2 cm. diam.; tunics of fairly coarse reddish brown reticulate fibres, with a neck 5—10 cm. long. *Stem* declinate, usually flexuose, velutinous, 5—15 cm. long (occasionally to 20 cm.), simple or with 1—2 branches. *Leaves* 5—7, distichous, lanceolate or ensiform, acute, the petiole extending 0·5—6 cm. above ground, the blade usually 6—10 cm. long, 0·6—2 cm. wide, laxly plicate, pubescent. *Spike* somewhat laxly to fairly closely 5—10-flowered, spirally arranged. *Bract* oblong or lanceolate, 1·8—3 cm. long, green, velutinous, the apex scariose, ferruginous, bidentate, sometimes with a central mucro and obtuse, acute or acuminate teeth; *bracteoles* free, shorter than the bract, lanceolate, acuminate, with narrow hyaline margins, the apex ferruginous. *Flowers* actinomorphic, the lower third of the perianth lobes scarlet, curved up to form a wide cup, the upper part bright blue, usually patent; *perianth tube* straight, 1·5—2 cm. long; *lobes* equal, obtuse or subobtuse, 2—2·4 cm. long, the lower third broadly unguiculate, widening into an ovate or suborbicular blade 1·1—1·4 cm. wide, the outer mucronulate and often more or less ciliate on the medial vein outside. *Stamens* trifarious or occasionally all directed to one side; filaments 1—1·3 cm. long; anthers 6—7 mm. long. *Ovary* rotund, about 3 mm. long, villous or sericeous above the base; style reaching to about the middle of the anthers, with very short branches and large flattened more or less orbicular irregularly crenulate stigmas fringed with very short gland-tipped hairs.

Confined to flats and low hills in the Malmesbury Division.

TYPE. Jacquin Ic. t. 285.

Flowering period. August—September.

PIKETBERG. *Schlechter* 5214.

MALMESBURY. Near Groenekloof: *MacOwan*, H.N.A.Af. 584 (partly). Laauwskloof, near Groenekloof: *Drege* 8384. Groenekloof: *Pappe* (21155 in S. Af. Mus.). Mamre hills: *Wasserfall* 455; *Barker* 1809. Between Mamre and Darling: *Lewis* 1052; *L. Bolus*. Near Darling: *Stokoe* (67328 in S. Af. Mus.); *Bolus* 12850; *Bachmann* 621. Six miles N. of Darling on Darling–Hopefield road: *Lewis* 2224.

WITHOUT LOCALITY. *Pappe; Gill; Harvey* 75; *Burmann; Thunberg* (*Gladiolus plicatus* sheet d, right-hand specimen); *Thunberg* in Herb. Burmann (named "*Ixia Babiana*" by Thunb.); *Raynaud.*

Apart from the very striking colouring, this species differs from *Babiana stricta* in having the perianth lobes divided into a wide upcurved claw and ovate or rounded patent blade, and very different style branches and stigmas.

Most of the material distributed by MacOwan as *B. stricta* var. *rubrocyanea*, H.N.A.Af. No. 584, is *B. rubrocyanea* but in the Bolus Herbarium and the herbarium of the University of Zürich there are specimens of *B. villosa* under this number.

7. **B. villosa** (Ait.) Ker, Bot. Mag. t. 583 (1802); Spreng. Syst. 1: 155 (1825); Dur. & Sch. Consp. Fl. Afr. 5: 202 (1895). *Ixia villosa* Ait. Hort. Kew. 1: 58 (1789); non Jacq. (1786–93); Willd. Sp. Pl. 1: 198 (1797), pro parte. *I. punicea* Jacq. Ic. t. 287 (1786–93) and Coll. Suppl. 12 (1796); Willd. l.c. 198, pro parte; Pers. Syn. 1: 48 (1805). *Gladiolus puniceus* Vahl Enum. 2: 144 (1806); non Lam. (1786); Poir. in Lam. Encyc. Suppl. 2: 793 (1812). *G. mucronatus* DC. in Réd. Lil. t. 142 (1807); non Jacq.

(1786–93). *G. mucronatus* var. Roem. & Schult. Syst. 1: 439 (1817). *G. villosus* Vahl l.c. 115, pro parte; Poir. l.c. 794; Roem. & Schult. l.c. 440. *Babiana punicea* Eckl. Top. Verz. 32 (1827). *B. stricta* (Ait.) Ker var. *villosa* (Ait.) Baker, Journ. Linn. Soc. 16: 166 (1877). *Ixia purpurea* var. Jacq. Ic. t. 286 b. *Gladiolus latifolius* Lam. Illustr. 1: 119 (1791); Poir. l.c. 794; Vahl l.c. 117.

Corm ovoid or globose, 2—2·6 cm. diam.; tunics of pale brown matted fibres, with a neck 7—10 cm. long. *Stem* erect or declinate, 12—20 cm. long, extending above the leaves, velutinous, simple or sometimes with 1 short branch. *Leaves* 5—7, distichous, patent or ascending, lanceolate or ensiform, acute or acuminate, plicate, villous or pubescent, 5—12 cm. long, 0·7—1·5 cm. wide. *Spike* distichous, fairly laxly 4—8-flowered. *Bract* oblong or narrow-oblong, 1·3—1·8 cm. long, usually truncate, retuse or bidentate with a short central mucro, herbaceous, pubescent, the apex scariose and ferruginous; *bracteoles* free, lanceolate, with narrow hyaline margins, the apex ferruginous, as long as the bract or slightly longer. *Flowers* actinomorphic or almost so, dark red or purple-red with large conspicuous purple-black anthers; *perianth tube* 1·2—2 cm. long, straight, very slender or filiform to within 1—2 mm. of the throat then abruptly expanded; *lobes* equal or the outer slightly narrower than the inner, oblong or obovate-oblong, obtuse, 1·8—2·8 cm. long, 0·8—1·4 cm. wide, the outer mucronate and ciliate on the medial vein outside. *Stamens* erect, symmetrically arranged round the style or occasionally unilateral and subarcuate; filaments 0·7—1 cm. long; anthers sagittate, 8—9 mm. long, 2—3 mm. wide. *Ovary* oblong or rotund, 3 mm. long, sericeous; style reaching to base or middle of anthers, with conduplicate spathulate or oblanceolate branches 3—5 mm. long.

Flats, hills and lower mountain slopes in the Tulbagh district.

LECTOTYPE. Bot. Mag. t. 583.

Flowering period. September.

TULBAGH. Tulbagh: *Marloth* 7170; *Grant* 2442; *Bolus* 5476; *Leighton* 1310; *Rehmann* 2224; *Pappe* (21153 in S. Af. Mus.); *Thom.* Mountains near Tulbagh Kloof: *Stokoe* & *Davis* (63470 in S. Af. Mus.). Tulbagh Road: *Heginbotham* 49. Fifteen miles from Ceres on Tulbagh road: *Story* 3014.

WITHOUT LOCALITY. *De Candolle; Thunberg* (*Gladiolus ringens*, sheet d, right-hand specimen); *Burmann; Commerson* (type of *G. latifolius* Lam., in Herb. Lam., Nat. Hist. Mus., Paris).

In the Flora Capensis Baker placed *Babiana villosa* as a synonym of *B. stricta* but it differs from that species not only in the striking colour of the flowers but also in having a much more slender perianth tube which is cylindrical almost to the throat, larger sagittate purple-black

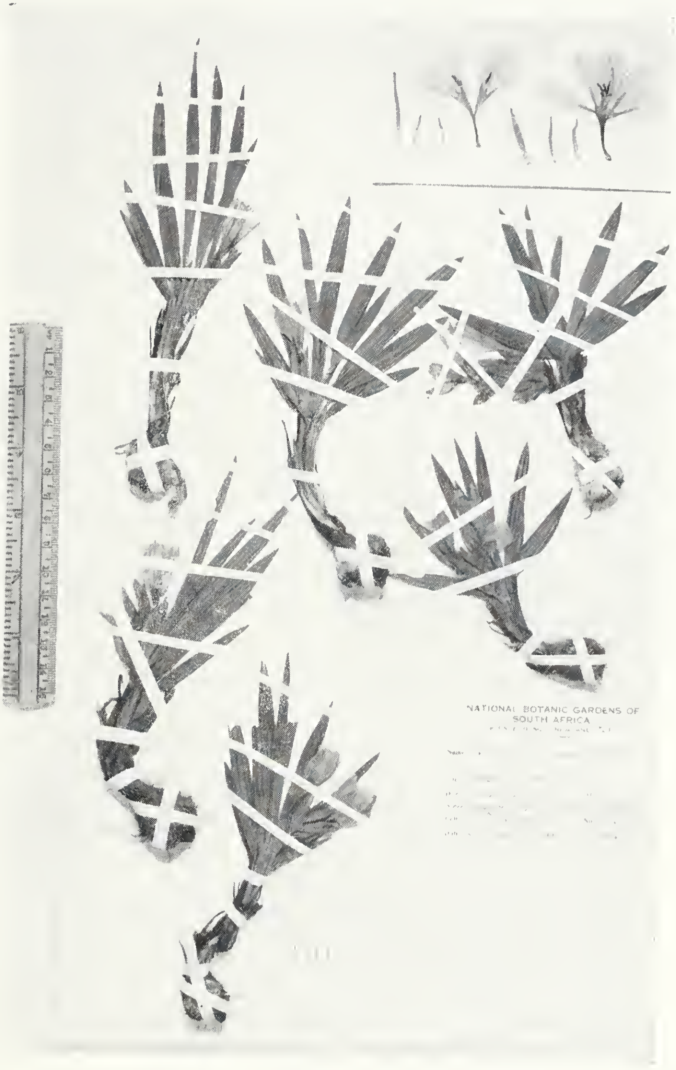

PLATE 5.
B. foliosa Lewis. Type sheet, in the Compton Herbarium.

anthers and the outer lobes of the perianth with a conspicuous line of hairs on the medial vein on the outer surface.

Lamarck described *Gladiolus latifolius* from Commerson's specimens which were recorded as coming from Île de France (Mauritius). In the herbarium of the Natural History Museum in Paris there are two sheets named *G. latifolius* by Lamarck, one in his own collection and the other in the general collection, and both are somewhat luxuriant cultivated plants of *Babiana villosa.* The error about their origin is a matter for speculation as it is not known whether the plants were in cultivation on Mauritius or whether Commerson mixed some plants collected at the Cape with some from the island.

Templemann in Herb. MacOwan No. 2478, for which the locality is given as Groenekloof (Malmesbury Division), is *B. villosa*, and so are a few of the specimens which were distributed by MacOwan under the number H.N.A.Af. 584, from Groenekloof, though the majority of specimens under the second number are *B. rubrocyanea.* These are the only records of *B. villosa* from that area, and it is therefore uncertain whether the locality was given in error due to the plants having been mixed with *B. rubrocyanea*, or whether the species did occur in that district but has since disappeared. The former supposition is more likely to be correct.

The following are hybrids, *B. villosa* x *B. stricta* var. *erectifolia*:—

TULBAGH. Romans River Siding: *Maguire* 1757. Between Darling Bridge and Michells Pass: *Lewis* 2651.

WORCESTER. Between Darling Bridge and Romans River Siding: *Salter* 6835.

B. villosa (Ait.) Ker var. **grandis** Lewis var. nov.

Plantae plerumque quam var. *villosa* breviores, foliis latioribus, bracteis longioribus et floribus majoribus. *Folia* acuta vel obtusa, ad 2·5 cm. lata, villosa. *Bractea* 2·5—3·5 cm. longa, villosa. *Flores* rosei antheris purpureo-nigris; *perianthii tubus* 3—3·5 cm. longus; *segmenta* oblonga vel obovato-oblonga, 3—3·5 cm. longa, 1·3—1·5 cm. lata, obtusa vel interdum retusa. *Stamina* recta, aequilateralia, filamentis 1·3—1·5 cm. longis antherisque 0·8—1 cm. longis et 3—4 mm. latis.

Plants usually shorter than in var. *villosa*, with wider leaves and much longer bracts and larger flowers. *Leaves* acute or subobtuse, up to 2·5 cm. wide, villous. *Bract* 2·5—3·5 cm. long, villous. *Flowers* pink with purple-black anthers; *perianth tube* 3—3·5 cm. long; *lobes* oblong or obovate-oblong, 3—3·5 cm. long, 1·3—1·5 cm. wide, obtuse or sometimes retuse. *Stamens* erect, symmetrically arranged round the style; filaments 1·3—1·5 cm. long; anthers 0·8—1 cm. long, 3—4 mm. wide. *Gynaecium* as in var. *villosa*.

Clay soil at Malmesbury.

TYPE. *Lewis* 5230 in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August—September.

MALMESBURY. Malmesbury Commonage: *Lewis* 5230.

8. **B. stricta** (Ait.) Ker (Plate 6), Bot. Mag. t. 621 (1802), excl. *Ixia plicata, I. villosa* and *Gladiolus plicatus* in syn.; Ker Gen. Irid. 150 (1827); Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 184 (1892) and Fl. Cap. 6: 113, pro parte; Eckl. Top. Verz. 33 (1827); Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895); Lewis in Adamson & Salter Fl. Cap. Pen. 244 (1950). *Gladiolus strictus* Ait. Hort. Kew. 1: 63 (1789), pro parte; Willd. Sp. Pl. 1: 220 (1797), pro parte; Vahl Enum. 2: 118 (1806); Roem & Schult. Syst. 1: 443 (1817), pro parte; DC. in Réd. Lil. t. 90 (1805); Lam. Illustr. 1: 119 (1791), pro parte. *Ixia scillaris* Mill. Gard. Dict. ed. 8, Ic. t. 155, f. 1 (1768); non L. (1762). *I. plicata* Lam. Encyc. 3: 336 (1789). *Gladiolus plicatus* Ait. l.c. 63, pro parte; Burm. Prodr. 1 (1768); Thunb. Diss. Glad. 24 (1784), pro parte; Lam. Illustr. 1: 119. *G. ringens* Thunb. Fl. Cap. ed. Schult., 54 (1823), pro parte; Lam. Illustr. 1: 119. *G. nervosus* Lam. Encyc. 2: 724 (1786) and Illustr. 1: 119. *Babiana sambucina* Eckl. Top. Verz. 33; non Ker (1805).

KEY TO THE VARIETIES

- Flowers yellow .. .. var. *sulphurea*
- Flowers not yellow.
  - Perianth tube less than 2 cm. long.
    - Stem declinate; flowers dark purple-blue, nearly always with a small dark red circle at the centre .. .. var. *regia*
    - Stem usually erect; flowers very pale to deep blue or mauve, without a red circle at the centre.
      - Leaves spreading fan-wise, lanceolate or ensiform .. var. *stricta*
      - Leaves erect, linear-lanceolate, linear or subulate .. var. *erectifolia*
  - Perianth tube 2 cm. long or more .. .. var. *grandiflora*

Var. **stricta.**

Corm ovoid or globose, 1·5—2·5 cm. diam.; tunics brown or reddish brown, with a neck 4—9 cm. long. *Stem* erect, often flexuose, or occasionally somewhat declinate, velutinous, 10—20 cm. high (sometimes to 30 cm.), usually much longer than the leaves, slender and simple or stout with 1—3 short erect branches. *Leaves* 6—8, lanceolate or ensiform, acute or occasionally acuminate, 4—12 cm. long, 0·6—1·2 cm. wide (sometimes to 1·7 cm.), plicate, pubescent, arranged fan-wise, the outer often horizontal. *Spike* fairly short, somewhat laxly 4—8-flowered, spirally arranged. *Bract* lanceolate or oblong, acute, obtuse and mucronate or truncate, usually 0·8—1·5 cm. long, herbaceous, pubescent, the apex brown or scariose and ferruginous; *bracteoles* free, linear-lanceolate, acuminate, with narrow hyaline margins, as long as the bract or slightly shorter. *Flowers* actinomorphic or almost so, scentless or faintly sweet-scented, purple, blue or mauve-blue, the 2 lower or all 3 inner lobes usually paler, sometimes yellowish, the lower lateral with small purple marks at the base; *perianth tube* straight, 1—1·8 cm. long, the upper half narrowly infundibuliform; *lobes* oblong or obovate-oblong, obtuse, 1·5—2·5 cm. long, 0·6—1·3 cm. wide, equal or the inner slightly longer and wider than the outer, the outer mucronulate and ciliate on the medial vein near the apex outside. *Stamens* symmetrically arranged round the style or the filaments parallel and straight with the anthers trifarious, sometimes the filaments slightly arcuate near the top and anthers subdeclinate; filaments 0·8—1·3 cm. long; anthers usually purple, lanceolate or sagittate, 4—6 mm. long, 1·5—2·5 mm. wide. *Ovary* rotund, 3—4 mm. long, villous or sericeous; style reaching to base or middle of anthers, the branches filiform, 2·5—3 mm. long, with small orbicular, oblanceolate or cuneate conduplicate stigmas.

Hillsides, lower mountain slopes and flats in the south-western districts of the Cape Province.

LECTOTYPE. Bot. Mag. t. 621.

Flowering period. August—September.

PIKETBERG. *Martin*, N.B.G. 1226/37.

HOPEFIELD. Between Vredenberg and Velddrif: *Martin*, N.B.G. 1246/36.

BELLVILLE. Road to Melkbosstrand: *Lewis* 86.

CAPE. Hout Bay: *Compton* 11755; *Lewis* 53. Near Little Lions Head: *Dod* 1548. Llandudno: *Compton* 14811; *Salter* 6241. Camps Bay: *Pappe; Zeyher* 129; *Marloth* 177; *Dod* 1770; *Lewis* 1214, 2204; *Barker* 3860. Clifton: *MacOwan* K/3. Table Mt.: *Ecklon* 125 b; *Schenck* 679; *Schinz*. Lions Head: *Pappe*. Cape Town, Stinkwater: *Rehmann* 1201, 1202. Rondebosch: *Pappe*. Claremont: *Bolus* 4603. Near Vygeskraal: *Dod* 509. Slopes of Wynberg Hill: *L. Bolus* (15823 in Herb. Bol.). Kenilworth Race Course: *Lewis* 57, 60. Wetton Vlei, near Wynberg: *Weintroub* (18350 in Herb. Moss). Mountain slopes near Tokai: *Salter* 333/14. Simons Bay: *Wright* 263. Cape Flats: *Rogers; Purcell*. Doornhoogde: *Zeyher* 1613.

PAARL. Between Paarl and Pont: *Drege* 8390 a, 8390 (partly). Between Berg River and Nieuwekloof: *Drege* 8388. Between Paarl and Wemmershoek Drift: *Arbuthnot*. Agter Paarl: *Drege* 8390 b.

STELLENBOSCH. Lynedoch: *Schenck* 557; *Barker* 1797. Stellenbosch: *Strey* 579.

Somerset West. Strand: *Wiese*, N.B.G. 573/34.

Caledon. Onrust: *Gillett* 4395.

Bredasdorp. Frikkies Bay: *Compton* 22145.

Without Locality. *Thunberg* (*Gladiolus plicatus* sheet a); *Harvey* 835; *Bowie* 7; *Niven; Roxburgh; De Candolle; Burmann; Sonnerat* (type of *G. nervosus* Lam. in Herb. Lamarck, Nat. Hist. Mus., Paris); *Jussieu* 3636 b; *Zeyher* 1613 a, 1613 b; *Lehmann; Verreaux.*

Miller's figure, Ic. t. 155, f. 1, first published in 1757 as an Ixia, without a specific name, was cited by Linnaeus under his description of *Gladiolus plicatus* in the second edition of his Species Plantarum in 1762. In the eighth edition of Miller's Dictionary, published in 1768, the same plate appears under the name *Ixia scillaris* L.! This is one of the extraordinary errors found in the eighth edition which was not edited by Miller himself but by an assistant. The compiler evidently overlooked Linnaeus' reference to the plate when he selected the name *I. scillaris* for this species, but as *I. scillaris* is an entirely glabrous and very different plant (=*Tritonia scillaris* (L.) Baker) it is difficult to understand how he could have made this mistake. The plant figured by Miller is the same as *Babiana stricta* (Ait.) Ker, Bot. Mag. t. 621, and because Linnaeus had identified it with his *Gladiolus plicatus*, Ker assumed that it was the same and cited *Ixia plicata* L. and *Gladiolus plicatus* L. in the synonymy under *Babiana stricta*. As he had used the name *B. plicata* a few months previously for the first species he described and figured (Bot. Mag. t. 576), Ker adopted Aiton's specific epithet for this species. The confusion about the identities of *Gladiolus plicatus* L. and *Babiana plicata* Ker is discussed in a note in the introduction to this revision, in which I explained that the plant depicted by Miller is *B. stricta*, and that it does not match the type of *Gladiolus plicatus* L. which must now be known as *Babiana villosula* (Gmel.) Ker ex Steud.

Gladiolus nervosus Lam. (1786) is the same as *Babiana stricta* but as the combination *B. nervosa* was used by Ker for the plant now known as *Anapalina revoluta* (Burm. f.) N. E. Br., it is not available. The type in Lamarck's herbarium is an incomplete specimen with only two leaves attached to the plant and a third mounted separately on the same sheet. Ecklon confused *Babiana sambucina* with *B. stricta* and all the specimens I have seen named *B. sambucina* by him are *B. stricta.*

B. stricta differs from *B. villosula* in having a longer stem, nearly always extending well above the leaves, shorter bracts and bracteoles and less fugacious flowers with a shorter and stouter perianth tube, shorter lobes and comparatively longer stamens. The colour and markings of the flowers are very different too. The species is extremely variable and the arrangement of the stamens in some forms indicates a state of

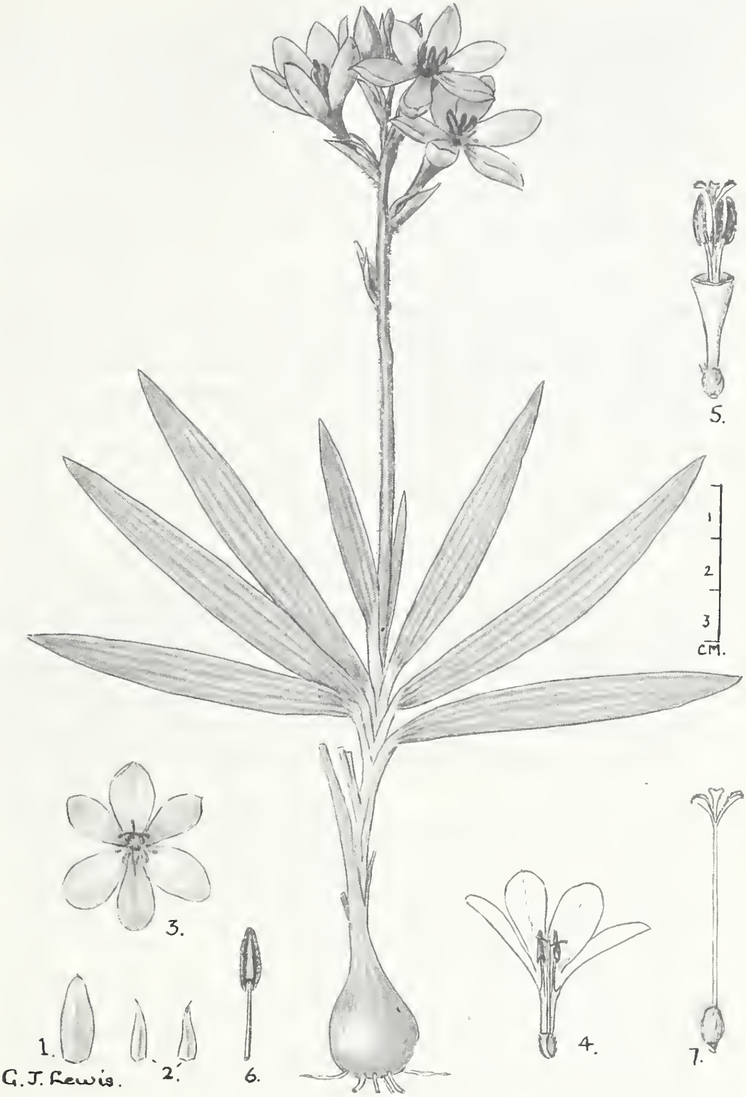

PLATE 6.
B. stricta (Ait.) Ker. (Slightly reduced.) Plant from mountain slopes above Camps Bay.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower. 5. Flower with perianth lobes removed, × 2. 6. Stamen × 2. 7. Gynaecium × 2.

transition from an actinomorphic to a zygomorphic flower. The perianth lobes are always equal in length and the stamens are usually symmetrically arranged round the style in the form which occurs on the Cape Peninsula, but in forms from the Cape Flats and other parts the filaments are parallel and sometimes slightly curved near the top with the anthers declinate.

B. stricta (Ait.) Ker var. **erectifolia** Lewis stat. nov. (Plate 7). *B. erectifolia* Lewis, Journ. S.A. Bot. 4: 3 (1938). ? *B. caesia* Eckl. Top. Verz. 32 (1827).

Corm, *spike* and *bracts* as in var. *stricta*. *Stem* slender, erect and flexuose, occasionally more robust and declinate. *Leaves* erect, linear, linear-lanceolate or subulate, acuminate, closely plicate, firm, sometimes somewhat pungent. *Flowers* usually mauve or pale mauve-blue with the inner lobes cream coloured or creamy mauve, the lower lateral marked with dark mauve dots at the base, or occasionally the whole flower dark mauve or violet, otherwise as in var. *stricta*.

Damp places on flats or low mountain slopes to up 470 metres in the Worcester, Paarl, Caledon, Robertson, Ceres and Somerset West Divisions.

TYPE. *Lewis*, N.B.G. 2686/32 in the Bolus Herbarium.

Flowering period. August—October.

PAARL. French Hoek, mountainside near top of Pass: *Phillips* 1316.

WORCESTER. Near Brand Vlei: *Lewis*, N.B.G. 2686/32. Near Worcester: *Leipoldt* (18559 in Herb. Bol.). Bains Kloof: *Compton* 18284. Darling Bridge: *Lewis* 4803; *Compton* 18335. Between Darling Bridge and Romans River Siding: *Salter* 6835. Between Worcester and Bains Kloof: *Story* 2903. Scherpenheuvel Vlei: *Barker* 7508. Near Moordkuil: *Lewis* 2893.

CERES. Near Ceres: *Bolus* 2623.

ROBERTSON. Boschjesmans Rivier: *Lewis* (22170 in Herb. Bol.); *Esterhuysen & Lewis*, N.B.G. 2710/35.

CALEDON. Flats E. of Viljoens Pass: *Davis* (61058 in S. Af. Mus.).

SOMERSET WEST. Sir Lowrys Pass: *Middlemost*, N.B.G. 1066/38. Somerset West: *Leighton* (22764 in Herb. Bol.); *Compton* 13461.

WITHOUT LOCALITY. *Ecklon & Zeyher* 55.8 (in Zürich Univ. Herb.).

From the brief description it is fairly certain that *Babiana caesia* Eckl. is the same as this variety, but the type, if still in existence, has not been seen. The date of flowering given by Ecklon for the plant he described is 20 Sept., but he gave no locality. I have seen two specimens named *B. caesia* by Ecklon but as the flowering month for both is August, neither can be the type. One of these, Ecklon & Zeyher 55.8 (in the University Herb., Zürich), is almost certainly the same as *B.*

stricta var. *erectifolia* but the other, Ecklon & Zeyher 131 (55.8), in the Herb. Delessert, Geneva, has a longer perianth tube and may be *B. purpurea* or *B. patersoniae* (the specimen was examined ten years ago and no flower was dissected so this is uncertain). The locality for Ecklon & Zeyher 55.8 is: "Caledon, Potrivier, Langehoogte, Bontjeskraal, bis am Zwartberg" and the flowering month is August. Baker did not cite *B. caesia* Eckl. in his work on Babiana but Durand and Schinz cited it as a synonym under *B. stricta* (Consp. Fl. Afr. 5: 202).

B. stricta (Ait.) Ker var. **sulphurea** (Jacq.) Baker, Journ. Linn. Soc. 16: 166 (1877), Handbk. Irid. 184 (1892) and Fl. Cap. 6: 113 (1896). *B. sulphurea* (Jacq.) Ker in Konig & Sims Ann. 1: 234 (1805) and Bot. Mag. t. 1053 (1807); Spreng. Syst. 1: 155 (1825); Dur. & Sch. Consp. Fl. Afr. 5: 202 (1895). *Gladiolus sulphureus* Jacq. Ic. t. 239 (1786–93) and Coll. 3: 258 (1789); Vahl Enum. 2: 99 (1806); Roem. & Schult. Syst. 1: 425 (1817); Pers. Syn. 1: 44 (1805); Poiret in Lam. Encyc. Suppl. 2: 270 (1812); Eckl. Top. Verz. 32 (1827). *G. plicatus* Andr. Bot. Rep. t. 268 (1802); non L. (1762). *Babiana flavocaesia* Eckl. l.c. 32.

Corm, leaves, bracts and *spike* as in var. *stricta*. *Stem* nearly always declinate. *Flowers* sulphur-yellow with purple-black anthers, the perianth tube usually dark blue or purple and the outer lobes sometimes more or less suffused with blue or mauve outside; *perianth tube* straight or occasionally curved, 1—1·5 cm. long; *lobes* equal, 2—2·5 cm. long, up to 1·4 cm. wide. *Stamens* and *gynaecium* as in var. *stricta*.

Flats and low hills in the Malmesbury, Bellville, Stellenbosch and Caledon Divisions.

TYPE. Jacquin Ic. t. 239.

Flowering period. September.

MALMESBURY. Near Malmesbury: *MacOwan* 1567. Swartland: *Rehmann* 893.

BELLVILLE. Tygerberg Hills: *Barker* 4810.

STELLENBOSCH. Stellenbosch Flats: *Strey* 582. Near Stellenbosch on Bottelary road: *Lewis* 2217.

CALEDON. Near Riviersonderend: *Pappe*.

WITHOUT LOCALITY. *Burmann*.

Ker considered this to be a separate species but noted: "It is difficult to define with any precision the specific difference between this and *stricta*, yet we think them distinct species. Besides general appearance, the stamens are here subascendent, not entirely trifarious, neither is the corolla precisely regular; the segments are also proportionately longer than the tube." I agree with Baker, however, in regarding this as a variety of *B. stricta*, for except for the colour of the flowers and the fact that the stem is nearly always declinate and the perianth tube very occasionally curved, there are no characters which distinguish this from some of the forms of the var. *stricta*.

No specimen named *B. flavocaesia* Eckl. has been seen but there is little doubt that it is merely a colour variation of *B. stricta* var. *sulphurea*. Plants collected by myself near Stellenbosch (*Lewis* 2217), flowering at the same time and from the same area as *B. flavocaesia*, agree with Ecklon's brief description. Among those collected by myself were many variations in colour, from pure pale sulphur-yellow to yellow and mauve or yellow and blue, with the perianth tube always bluish and this colour sometimes extending in a medial line up the outer lobes, or the outer lobes sometimes suffused with mauve.

Some plants of garden origin with white or cream-coloured sweet-scented slightly zygomorphic flowers have been named *B. sulphurea*, but these may be the white colour form of *B. plicata* or they may possibly be hybrids between *B. stricta* var. *sulphurea* and *B. odorata*.

B. stricta (Ait.) Ker var. **regia** Lewis var. nov.

Cormus, caulis, bracteae et *spica* var. *strictae* similes, sed caulis semper declinatus. *Folia* plerumque ascendentia vel suberecta, lanceolata vel lineari-lanceolata, firme plicata, hispidula. *Bractea* 1·2—2·2 cm. longa. *Flores* violacei fere ad medium anulo cruento notati; *perianthii tubus* rectus vel raro leviter curvatus, 1—1·2 cm. longus; *segmenta* aequalia, oblonga vel obovato-oblonga, obtusa, 1·5—2 cm. longa, 0·8—1 cm. lata. *Stamina* aequilateralia filamentis 8 mm. longis antherisque 4—5 mm. longis, var. *strictae* similia.

Corm, stem, bracts and *spike* as in var. *stricta* but the stem almost always declinate. *Leaves* usually ascending or suberect, lanceolate or linear-lanceolate, closely and firmly plicate, hispidulous. *Bract* 1·2—2·2 cm. long. *Flowers* dark purple-blue, almost always with a dark blood-red ring at the centre; *perianth tube* straight or rarely slightly curved, 1—1·2 cm. long; *lobes* equal, oblong or obovate-oblong, obtuse, 1·5—2 cm. long, 0·8—1 cm. wide. *Stamens* symmetrically arranged round the style, with filaments 8 mm. long and anthers 4—5 mm. long, as in var. *stricta*. *Gynaecium* as in var. *stricta*.

Damp sandy flats in the Bellville, Paarl and Stellenbosch Divisions.

TYPE. *Lewis* 2216, in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. September—October.

BELLVILLE. Phesantekraal: *Compton* 16011; *Leighton* 645, 646. Between Durbanville and Phesantekraal: *Leighton* 647. Hercules Pillar: *Barker* 1817.

Paarl. Klapmuts: *Walgate* 287.

Stellenbosch. Mulders Vlei: *Lewis* 4412. Kraaifontein: *Barker* 4817. Near Stellenbosch, on Bottelary road: *Lewis* 2216. Near Stellenbosch: *Peers*, N.B.G. 1023/38; *Sister Thomas*, N.B.G. 1394/31; *L. Bolus*. Elsenberg: *Grant* 2511. Klein Drakenstein: *Drege* 8391.

This is distinguished from var. *stricta* by its slightly narrower more erect and firmly plicate hispidulous leaves, declinate stem, and the colour of the flowers, though the red ring at the centre is sometimes extremely small and sometimes absent. In some herbaria it has been confused with *B. rubrocyanea* but the flowers are much darker, with a smaller dark blood-red centre, the perianth tube is shorter and the stigmas are much smaller and differ in shape. When fully open the perianth lobes are patent or erecto-patent, spreading from the base, whereas in *B. rubrocyanea* the lower subunguiculate portion of the lobes is suberect, forming a wide cup, and in bright sunlight the blade portion is patent.

A hybrid between this variety and *B. pulchra*, *Lewis* 2215, has been recorded from near Stellenbosch, on the Bottelary road; both parents were found in the vicinity.

B. stricta (Ait.) Ker var. **grandiflora** Lewis var. nov.

Cormus, caulis et *spica* var. *strictae* similes. *Folia* 4—5, ascendentia vel suberecta, ensiformia vel lanceolata, acuta vel acuminata, 7—15 cm. longa, 0·7—1·5 cm. lata, laxe plicata, pubescentia vel villosa. *Bractea* 1·5—3 cm. longa, villosa, var. *strictae* similis; *bracteolae* lineari-lanceolatae, quam bractea leviter breviores. *Flores* lilacini vel roseo-lilacini; *perianthii tubus* 2·2—3·2 cm. longus, inferne tenuis tertia parte superiore infundibuliformi; *segmenta* aequalia vel exteriora quam interiora leviter angustiora, oblanceolata vel lineari-oblonga, obtusa, 2·2—2·8 cm. longa, 0·7—1·1 cm. lata, exteriora mucronulata et interdum nervo medio ad apicem extrinsecus ciliato. *Stamina* recta, filamentis 1·1—1·3 cm. longis antherisque 7—8 mm. longis et circa 1·5 mm. latis.

Corm, stem and *spike* as in var. *stricta*. *Leaves* 4—5, ascending or suberect, ensiform or lanceolate, acute or acuminate, 7—15 cm. long, 0·7—1·5 cm. wide, laxly plicate, pubescent or villous. *Bract* 1·5—3 cm. long, villous, otherwise as in var. *stricta; bracteoles* linear-lanceolate, slightly shorter than the bract. *Flowers* mauve-blue to pinkish mauve; *perianth tube* 2·2—3·2 cm. long, the upper third infundibuliform, slender below; *lobes* equal or the outer slightly narrower than the inner, oblanceolate or narrow-oblong, obtuse, 2·2—2·8 cm. long, 0·7—1·1 cm. wide, the outer mucronulate, sometimes ciliate on the medial vein near the apex outside. *Stamens* erect; filaments 1·1—1·3 cm. long; anthers 7—8 mm. long, about 1·5 mm. wide. *Gynaecium* as in var. *stricta*.

Flats in the Piketberg Division.

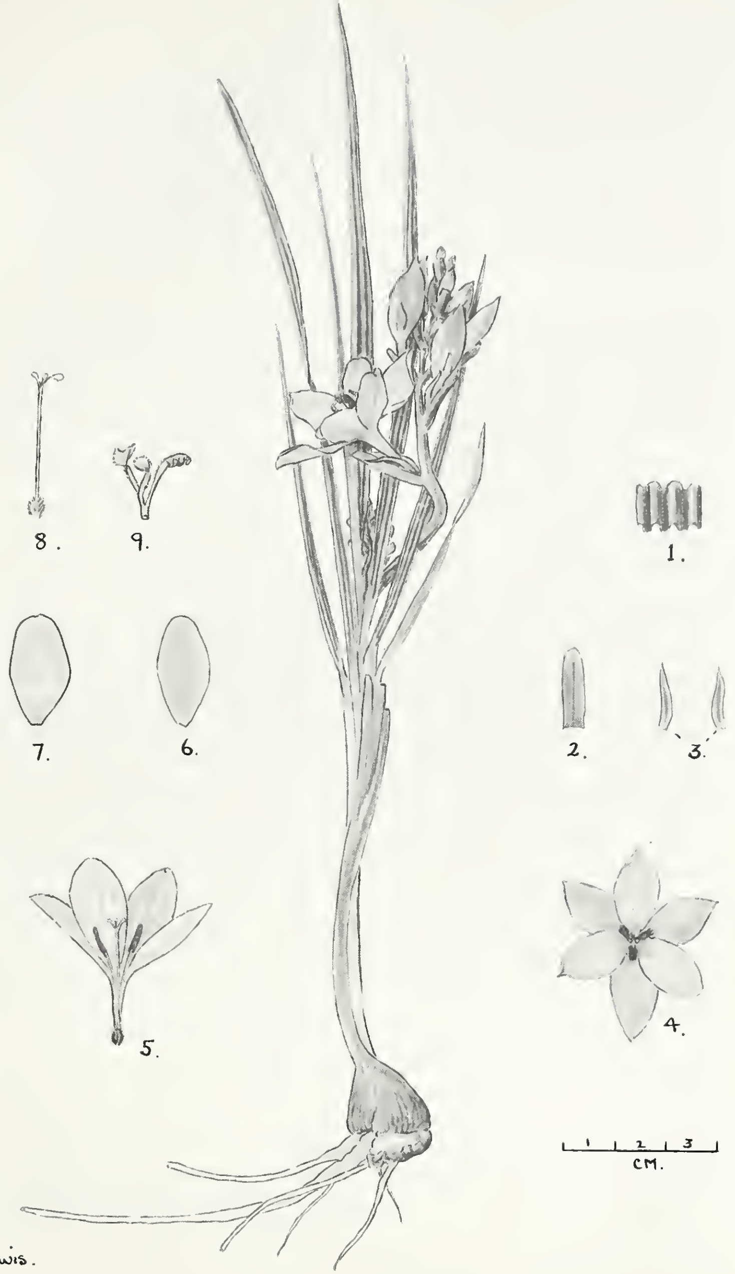

PLATE 7.
B. stricta (Ait.) Ker var. *erectifolia* Lewis. (Slightly reduced.) Plant from Brand Vlei, Worcester Division, grown in National Botanic Gardens, Kirstenbosch.
1. Portion of leaf × 3. 2. Bract. 3. Bracteoles. 4. Flower, front view. 5. Section of flower. 6. Outer perianth lobe. 7. Inner perianth lobe. 8. Gynaecium. 9. Style branches × 3.

Type. *Lewis* 2197 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. July—August.

Piketberg. Eighteen miles N. of Piketberg on Redlinghuis road: *Lewis* 2197; *Barker* 6371.

The longer bracts and larger flowers, with a longer perianth tube, distinguish this from var. *stricta*.

9. **B. purpurea** (Jacq.) Ker (Plate 8), Bot. Mag. sub t. 1019 (1807); Dur. & Sch. Consp. Fl. Afr. 5: 200 (1895). *Ixia purpurea* Jacq. Ic. t. 286 (1786–93) and Coll. 3: 268 (1789); Pers. Syn. 1: 48 (1805). *Gladiolus purpureus* (Jacq.) Willd. Sp. 1: 198 (1797); Vahl Enum. 2: 114 (1806); Roem. & Schult. Syst. 1: 438 (1817). *Babiana stricta* (Ait.) Ker var. *purpurea* (Jacq.) Ker, Bot. Mag. t. 1052 (1807); Baker, Journ. Linn. Soc. 16: 166 (1877). *Ixia flabelliformis* Salisb. Prodr. 37 (1796), pro parte.

Corm subglobose, 2—2·5 cm. diam.; tunics matted, of fairly coarse brown or reddish brown fibres, with a neck 4—7 cm. long. *Stem* erect, velutinous, often flexuose, 10—15 cm. high, simple or with 1—3 branches. *Leaves* 6—7, ascending or suberect, lanceolate, acute or acuminate, 6—12 cm. long, 5—8 mm. wide, plicate or laxly plicate, pubescent or puberulous. *Spike* distichous, laxly or fairly closely 4—10-flowered. *Bract* lanceolate or oblong, 1·5—2·5 cm. long, herbaceous, pubescent, the apex brown and sphacelate or scariose and ferruginous, acuminate, acute or bidentate with a small central mucro; *bracteoles* free, lanceolate, acuminate, with narrow hyaline margins, slightly shorter than the bract. *Flowers* usually actinomorphic, fragrant, mauve-purple or deep purple-pink with dark anthers, the perianth tube purple and the lobes with a purple medial line outside; *perianth tube* straight or occasionally with a slight curve at the throat, 1·8—2·8 cm. long, slightly expanded towards the throat, the upper third or half very narrowly infundibuliform; *lobes* obovate to oblong, obtuse or occasionally retuse, 1·8—2 cm. long (rarely to 2·5 cm.), 0·9—1·2 cm. wide, equal or the inner slightly wider than the outer, the outer usually mucronulate and ciliate on the medial vein outside. *Stamens* symmetrically arranged round the style or all directed to one side and subarcuate; filaments 1—1·4 cm. long; anthers sagittate, 6—8 mm. long, 2—3 mm. wide. *Ovary* rotund, 3 mm. long, villous above the base; style usually reaching to top of anthers, the branches 3—4 mm. long, with fairly large more or less orbicular stigmas, flattened or conduplicate, minutely ciliate with gland-tipped hairs, sometimes crenulate.

Sandy soil on flats and hills in the Caledon Division with out-liers in the Bredasdorp and Robertson Divisions.

Type. Jacquin Ic. t. 286.

Flowering period. August—September.

ROBERTSON. Between Ashton and Robertson: *Barker* 7383.

CALEDON. Near Bot River: *Lewis* 4800; *Barker* 4120. Sir Lowrys Pass: *Spilhaus.* Houwhoek: *Gillett* 4286; *Story* 3065. Langhoogte: *Mund* 9. Villiersdorp–Caledon road, Riviersonderend Bridge: *Salter* 4789. Caledon Commonage: *Barker* 3; *Garside* 91; *Mathews,* N.B.G. 267/13. Near Hot Springs: *Marloth.* Onrus: *Gillett* 4400 d. Caledon district: *Rogers* 28877, 29176; *Prior.*

BREDASDORP. Between Napier and Caledon: *Steytler,* N.B.G. 1783/33.

Ker first established this as a species of Babiana, based on Jacquin's figure of *Ixia purpurea,* but a few months later, when it was figured in the Botanical Magazine (t. 1052) from a living plant grown in England, he reduced it to a variety of *Babiana stricta.* Baker did not recognize it as a variety, citing *B. purpurea* Ker in the synonymy under *B. stricta* in the Flora Capensis, but it was upheld as a separate species by Durand and Schinz, who cited Jacquin Ic. t. 286 and 286 b, Bot. Mag. t. 1052, and a single collecting, *Drege* 8480. I have not seen the Drege specimens but have examined living plants from the Caledon Division which exactly match the very good illustration in the Botanical Magazine, and agree with Durand and Schinz in upholding *B. purpurea* as a species. The only point with which I do not agree is the citation of Jacquin Ic. t. 286 b, regarded as a variety of *Ixia purpurea* by Jacquin, as this appears to be a colour form of *Babiana villosa* (=*Ixia punicea* Jacq. Ic. t. 287), or possibly a hybrid between *B. villosa* and *B. purpurea.* *B. villosa* differs from *B. purpurea* in having a shorter perianth tube which is very slender and cylindrical to within 1—2 mm. of the throat, as well as a shorter style and smaller, less rounded stigmas not overtopping the anthers.

B. purpurea is undoubtedly very closely allied to *B. stricta* but apart from the colour and scent of the flowers it is distinguished by having a longer perianth tube, as long as the lobes or longer, wider sagittate anthers and somewhat conspicuous rounded stigmas projecting well above the anthers. Dried herbarium specimens sometimes resemble the western form of *B. patersoniae,* from which *B. purpurea* differs in having more regular flowers, the perianth tube nearly always straight, the lobes wider and equal in length, and considerably wider anthers. The colour of the flowers too is different.

10. **B. pulchra** (Salisb.) Lewis comb. nov. *Acaste pulchra* Salisb., Trans. Hort. Soc. 1: 322 (1812). *Babiana stricta* (Ait.) Ker var., Ker in Bot. Mag. t. 637 (1803). *B. angustifolia* Sweet Hort. Brit. ed. 1, 396 (1827) and ed. 2, 499 (1830); Dur. & Sch. Consp. Fl. Afr. 5: 198 (1895).

B. stricta (Ait.) Ker var. *angustifolia* (Sweet) Baker, Journ. Linn. Soc. 16: 166 (1877), Handbk. Irid. 184 (1892) and Fl. Cap. 6: 113 (1896). *Ixia villosa* var. Jacq. Frag. t. 14, f. 3 (1800). *Babiana atrodeltoidea* Eckl. Top. Verz. 33 (1827). *B. atrocyanea* Eckl. l.c. 33. *B. intermedia* L. Bolus, S.A. Gard. & Country Life 22: 277 (1932).

Corm ovoid or globose, 1—2 cm. diam.; tunics of fairly coarse brown fibres with a neck 7—11 cm. long. *Stem* slender, curved shortly above ground, sometimes at a right angle, declinate or sometimes suberect, pubescnt or velutinous, simple or branched, 10—20 cm. long. *Leaves* 5—7, distichous, patent or suberect, the petioles usually extending 1—7 cm. above ground and enclosing the base of the stem, the blades lanceolate or ensiform, acute or acuminate, plicate, shortly pubescent, 4—10 cm. long, 0·5—1·5 cm. wide. *Spike* fairly laxly 5—10-flowered, secund or spirally arranged but with the flowers more or less twisted to one side and secund. *Bract* lanceolate or narrow-oblong, 1—2 cm. long, acute, obtuse or truncate with a very short mucro, herbaceous, pubescent, the apex scariose and ferruginous; *bracteoles* free, lanceolate, with narrow hyaline margins, as long as the bract or slightly shorter. *Flowers* slightly twisted and facing the stem apex, usually dark blue or violet, the perianth tube and base of the lobes paler and the lower lobes with purple-black or dark red marks near the base, sometimes blue with the lower lateral lobes pale yellow or cream coloured, marked with two small blackish patches near the base; *perianth tube* 1·1—1·7 cm. long, usually curved and slightly twisted at the base or shortly above, the upper half narrowly infundibuliform; *lobes* sometimes arising very slightly obliquely, oblong or oblanceolate-oblong, obtuse, 1·5—2·5 cm. long, 0·6—1·1 cm. wide, equal or the outer a little narrower than the inner, somewhat concave, the outer mucronulate and sometimes ciliate on the medial vein outside. *Stamens* subarcuate; filaments 0·8—1·2 cm. long; anthers 5—6 mm. long. *Ovary* rotund, 3 mm. long, villous or sericeous; style usually straight and somewhat apart from the stamens, reaching to top of anthers or slightly above, the branches filiform, 4—5 mm. long, with small orbicular or cuneate conduplicate stigmas.

On flats, usually in damp places with clay or heavy sandy soil.

TYPE. Bot. Mag. t. 637.

Flowering period. August—September.

PIKETBERG. Piekeniers Kloof: *Lamb*, N.B.G. 647/30. Between Greys Pass and Piketberg: *L. Bolus.* Near Porterville: *Lewis* 3571; *Barker* 5825, 8098; *Steyn* 609. Near Piketberg: *Barker* 2572; *van Zyl*, N.B.G. 625/27 a; *Lewis* 2646; *Maguire* 2031. Berg River Bridge: *Barker* 2686. Near Berg River: *Barker* 5811; *Leighton* 449. Between Sauer and Hopefield: *A. Wilman* 774.

DEPT.

Hopefield. Eight miles S.E. of Hopefield: *Salter* 2699 a. Near Hopefield: *Lewis*, N.B.G. 2185/32; *Letty* 263.

Tulbagh. Saron: *Schlechter* 10674; *Steyn* 601; *Compton*, N.B.G. 1885/36. Tulbagh Kloof at foot of Winterhoeksberg: *Ecklon* and *Zeyher*. Tulbagh: *Thom*. Twenty-four Rivers: *Lewis* (21856 in Herb. Bol.), Five miles S. of Gouda: *Theron* 2015.

Malmesbury. Two miles S. of Berg River Bridge: *Salter* 3677. Five miles S. of Moorreesburg: *Salter* 2809. Between Moorreesburg and Malmesbury: *Barnes*. Ten miles N.W. of Malmesbury: *Lewis* 2222. Between Malmesbury and Hopefield: *Lewis* 2221. Between Malmesbury and Darling: *Arbuthnot* and *Lavis*. Near Ysterfontein: *Salter* 1346. Darling Flower Reserve, near Ysterfontein: *Lewis* 5085; *Barker* 8646. Between Darling and Ysterfontein: *L. Bolus* (type of *Babiana intermedia*, No. 20167 in Herb. Bol.). Near Darling: *Bolus* 12845; *Guthrie* 2124; *Grant* 2530; *Compton*, N.B.G. 1167/26; *Barker* 2676; *Lewis* 2223. Between *Mamre* and Darling: *Leighton* 2121. Mamre hills: *Compton* 11778, 17443; *Mathews*, N.B.G. 500/13; *Wasserfall* 953. Groenekloof: *Bolus* 4343; *MacOwan* 586. Paardeberg: *Salter* 7666.

Bellville. North of Tygerberg: *Barker* 4804.

Cape. Vissershok: *Barker* 2536.

Stellenbosch. *Garside* 89.

Paarl. Agter Paarl: *Lewis* 4418. Near Huguenot: *Lewis* 4801; *Compton* 18328. Paarl: *Esterhuysen* 6124.

Wellington. Between Hermon and Tulbagh Kloof: *Bolus*. Near Wellington: *L. Bolus*, N.B.G. 2958/32; *Compton* 11623. Hermon: *Zinn* (52971 in S. Af. Mus.); *Barnard* (52934 in S. Af. Mus.).

Without Locality. *Harvey; Thom; Roxburgh; Burmann* (2 sheets, one named *Ixia axillaris* and the other *I. pumila* by Burmann); *Zeyher* 394.

A polymorphic species closely allied to *Babiana stricta* from which it differs in having the stem declinate and the flowers almost always twisted and directed to one side in a more or less secund inflorescence, the perianth tube slightly to distinctly curved and twisted and the upper lobes and arcuate stamens turned to face towards the apex of the stem. These differences are very obvious in living plants but not always readily discernible in dried specimens. There is a great deal of variation in the colour and size of the flowers but it has not been possible to separate varieties as the various forms are connected by intermediates. Plants from the Paarl and Wellington Divisions have been found which exactly match the plant figured in the Botanical Magazine, t. 637, a good figure in which the characters of the inflorescence and flower are clearly depicted. To the north of Darling and Wellington the flowers become gradually paler and in the Hopefield, Piketberg and Tulbagh Divisions they are

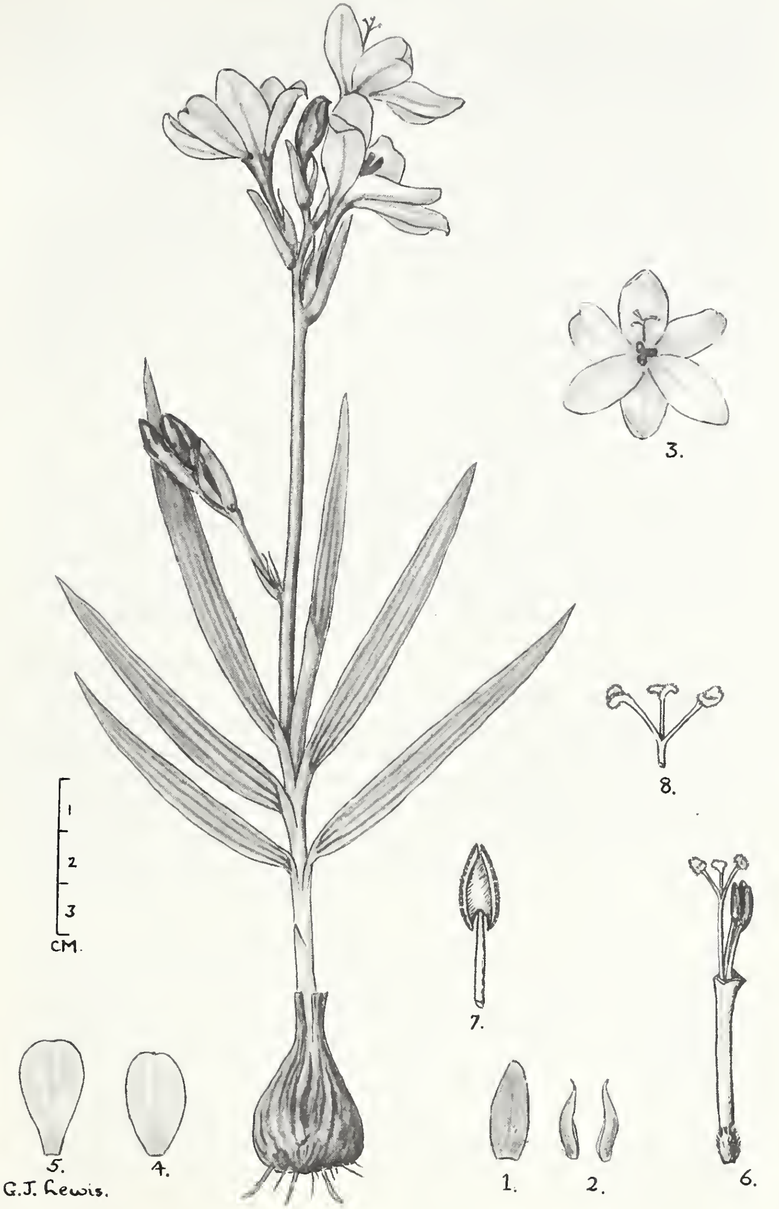

PLATE 8.

B. purpurea (Jacq.) Ker. (Slightly reduced.) Plant from near Bot River, Caledon Division.

1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Outer perianth lobe. 5. Inner perianth lobe. 6. Flower with perianth lobes removed, × 1½. 7. Stamen × 3. 8. Style branches × 3.

distinctly bicoloured, the lower lateral lobes being pale yellow or cream coloured with the dark mark near the base divided into two by the paler colour. In the vicinity of Piketberg the stem is more erect, and the perianth lobes are sometimes slightly narrower, though the flowers always face towards the apex of the stem.

The form from the vicinity of Darling, in the Malmesbury Division, which was named *B. intermedia* by Dr. L. Bolus, has deep royal blue flowers with a dark red somewhat spatulate-shaped mark on the three lower lobes. Dr. Bolus' choice of the specific name refers to the fact that the species is intermediate between the sections Acaste and Babiana. Although the flowers are always zygomorphic, the perianth lobes are equal or almost so, sometimes the inner slightly wider and longer than the outer, and for this reason, as well as its very marked affinity with *B. stricta*, it is placed in the section Acaste.

From the brief descriptions there can be little doubt that *B. atrocyanea* and *B. atrodeltoidea* Eckl. are colour forms of this species, but no specimens to which these names were given by Ecklon have been seen. In the Bolus Herbarium specimens of Schlechter's No. 5154, from Alexandershoek in the Clanwilliam Division, belong to this species but there has evidently been some mistake as there are no other records from the Clanwilliam Division, and in the Zürich University Herbarium *Schlechter* 5154 is *B. lineolata* Klatt, which does occur in that area.

Section Babiana

Leaves linear to ensiform or sometimes obliquely ovate, usually more or less plicate and pubescent, occasionally glabrous, spirally twisted or undulate. Bract and bracteoles herbaceous, the bracteoles free or more or less united. Flowers zygomorphic, often bilabiate, with a short or long perianth tube, the lobes usually arising obliquely and slightly to very unequal, rarely subequal, sometimes subunguiculate or shortly unguiculate. Ovary glabrous to sericeous.

Type species: *B. plicata* Ker.

11. **B. lineolata** Klatt (Plate 9), Abh. Naturf. Ges. Halle 12: 347 (1882); Erganz. 13 (1882); Baker Handbk. Irid. 180 (1892) and Fl. Cap. 6: 107 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895). *B. stenophylla* Baker, Bull. Herb. Boiss. Ser. 2, 1: 866 (1901). *Gladiolus plicatus angustifolius* Jacq. Ic. t. 238 (1786–93) and Coll. 4: 156 (1790). *G. stenophyllus* Schrank in Denksch. Bot. Ges. Regensb. 2: 212 (1822), pro parte. *G. strictus* Lam. Illustr. 1: 119 (1791); non Ait. (1789).

Corm ovoid or subglobose, 1—2 cm. diam.; tunics of fairly coarse brown fibres, with a neck 6—12 cm. long. *Stem* erect, terete, usually slender and somewhat flexuose, 13—25 cm. high (usually about 15 cm.), longer than the leaves, subglabrous to villous, simple or with 1—6 short branches. *Leaves* 5—8, erect or suberect, linear or lanceolate, acuminate, firmly plicate, sometimes slightly pungent, glabrous, subglabrous or somewhat sparsely pubescent, 5—20 cm. long, 0·2—1 cm. wide, usually 5—10 cm. long and 2—6 mm. wide. *Spike* distichous, laxly to fairly closely 4—12-flowered. *Bract* narrow-oblong, acute or obtuse, 0·7—1·2 cm. long, herbaceous, the apex sphacelate, hispidulous at the base only or pubescent nearly to the apex; *bracteoles* free, lanceolate, acuminate, with hyaline margins, as long as the bract or slightly shorter. *Flowers* zygomorphic, pale blue or mauve, the lower lateral lobes lighter in colour with a pale yellow area in the middle and purplish markings near the base; *perianth tube* straight, very slender at the base, expanded slightly towards the throat, 0·8—1 cm. long; *lobes* arising obliquely, unequal, the outer oblanceolate, 4—5 mm. wide, the inner oblong or obovate-oblong, 6—8 mm. wide, all obtuse, the 3 upper subunguiculate and 3 lower very shortly unguiculate; dorsal lobe more or less apart from the others, 1·6—2·2 cm. long; lower lateral lobes 1·2—1·5 cm. long, the blade concave. *Stamens* arcuate; filaments 1·1—1·4 cm. long; anthers 4·5—6 mm. long. *Ovary* rotund or turbinate, about 2 mm. long, villous or sericeous; style usually reaching to middle of anthers, with spathulate or oblanceolate conduplicate branches 3 mm. long.

Moist sandy flats in the Piketberg and Clanwilliam Divisions.

Type. *Ecklon* 132 in the Berlin-Dahlem Herbarium.

Flowering period. September.

Clanwilliam. Brakfontein, near Olifantsrivier: *Ecklon* 132 (type of *Babiana lineolata* in Berlin-Dahlem Herb. and of *B. stenophylla* Bkr. in Zürich Un. Herb.). Alexanders Hoek: *Schlechter* 5154 (in Zürich Un. Herb. but not Herb. Bol.). Citrusdal: *Lewis*, N.B.G. 2009/36; *Barker* 3076; *Salter* 2728, 3660. Three to five miles N. of Citrusdal: *Salter* 7491; *Lewis* 1367. Modderfontein: *Engels*, N.B.G. 4169/14. Road from Warm Baths to Modderfontein: *Stephens* 7072. Between Groot Kloof and Elands Kloof: *Leipoldt* 3041. Lange Valley: *Leighton* (21470 in Herb. Bol.).

Piketberg. Redlinghuis: *Thorne* (52924 in S. Af. Mus.). Het Kruis: *Stephens* and *Glover* 8608. Between Het Kruis and Kapiteins Kloof: *Zinn* (52915 in S. Af. Mus.). Berg Valley: *Lewis* 1877; *Barker* 4778; *Esterhuysen*, N.B.G. 2385/34. Underberg Valley: *Penther* 606.

Ceres. Elands Kloof and De Keur: *Compton*, N.B.G. 2009/36.

Without Locality. *Lamarck; Jussieu* 3636 a; *Thom* (locality given as Tulbagh but this is doubtful); *Thunberg* (*Gladiolus plicatus* sheet f).

The plants are variable both as to size and the amount of pubescence but the flowers are uniformly small, the smallest in the section Babiana and among the smallest in the genus. Material of *Ecklon* and *Zeyher* 132 from several herbaria has been examined and in all the specimens the leaves are narrow and glabrous or subglabrous and the stem simple or with 1 or 2 branches, while in more recent collectings specimens exactly matching the type have been found growing with more luxuriant plants with wider, more or less pubescent leaves, the stem usually bearing 1 to 6 branches, and the spike 6—12-flowered.

Without seeing the type, Baker placed *Babiana lineolata* near *B. hypogea* and *B. tubiflora* in the Flora Capensis (i.e. with the long-tubed species), and a few years later described an isotype in the Zürich University Herbarium as a new species, which he named *B. stenophylla.* On comparing the types of *B. stenophylla* and *B. lineolata* I found them to be identical.

Gladiolus stenophyllus Schrank is partly this species, since the author gave as a synonym *G. plicatus angustifolius* Jacq., but the description seems to apply to more than one species and as I have not seen any specimens so named, the identity of the plant or plants described is uncertain. Klatt placed *G. stenophyllus* Schrank in herb. ex Klatt as a synonym of *Babiana nana* Spreng. However, even if *Gladiolus stenophyllus* Schrank proved to be the same as *Babiana lineolata* Klatt, the older specific epithet cannot be used for this species. Baker's use of this name was fortuitous, as is evident from the fact that he made no reference to *Gladiolus stenophyllus* Schrank and in fact gave this name to a species of Gladiolus.

12. **B. plicata** Ker (Plate 1), Bot. Mag. t. 576 (1802); Spreng. Syst. 1: 155 (1825), pro parte; Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 183 (1892) and Fl. Cap. 6: 112 (1896), pro parte; Dur. & Sch. Consp. Fl. Afr. 5: 200 (1895), pro parte. *Gladiolus plicatus* Thunb. Diss. Glad. 24 (1784), Prodr. 9 (1800) and Fl. Cap. ed. Schult. 53 (1823), pro parte; non L. (1762). *G. plicatus* Jacq. Ic. t. 237 (1786–93) and Coll. 4: 155 (1790); Roem. & Schult. Syst. 1: 441 (1817), pro parte. *G. fragrans* Jacq. Hort. Schoenbr. t. 14 (1797); Roem. & Schult. l.c. 442; Vahl Enum. 2: 116 (1806), pro parte; Poir. in Lam. Encyc. Suppl. 2: 789 (1812). *Babiana disticha* Ker, Bot. Mag. t. 626 (1803), Konig & Sims Ann. 1: 234 (1805) and Gen. Irid. 149 (1827); Spreng. l.c. 156; Dur. & Sch. l.c. 199; Baker, Journ. Linn. Soc. 16: 165, Handbk. Irid. 184 and Fl. Cap. 6: 112, pro parte (excl. specimens cited); Lewis in Adamson & Salter Fl. Cap. Pen. 244 (1950). *Gladiolus distichus* Roem. & Schult. l.c. 440. *Babiana lilacina* Eckl. Top. Verz. 31 (1827).

Corm ovoid or subglobose, 2—3 cm. diam.; tunics of fairly coarse thickly matted brown or reddish brown fibres, with a neck 10—15 cm. long. *Stem* erect, usually flexuose, velutinous, 7—20 cm. high, fairly stout and overtopping the leaves, simple or with 1—3 short suberect branches. *Leaves* 6—8, distichous, spreading fan-wise or sometimes suberect, lanceolate, oblong-lanceolate or ensiform, acute or acuminate, laxly or firmly plicate, pubescent, usually 8—12 cm. long, 1—2 cm. wide. *Spike* distichous, fairly closely 4—10-flowered. *Bract* oblong or lanceolate, 1·2—2·5 cm. long, herbaceous, pubescent, often densely villous at the base, the apex scariose, ferruginous, truncate, acute, acuminate or unequally tridentate with a central mucro and obtuse or truncate lateral teeth; *bracteoles* free, as long as the bract or slightly shorter, lanceolate, acute or acuminate, usually with narrow hyaline margins, the apex scariose and ferruginous. *Flowers* zygomorphic, varying from violet to pale blue or occasionally white, the lower half of the lower lateral lobes usually with a small or large yellow area marked with 2 purple dots at the base, fragrant; *perianth tube* usually 1·8—2·5 cm. long, narrowly infundibuliform above the middle, slightly curved shortly below the throat; *lobes* arising slightly obliquely, patent, the 3 upper usually slightly longer than the 3 lower and the inner a little wider than the outer, rarely subequal, all obtuse or sometimes retuse, 1·5—2·5 cm. long, 0·7—1 cm. wide, the outer oblong or narrow-oblong, mucronate or mucronulate and often ciliate on the medial vein outside, the inner oblong or obovate-oblong, with flat or undulate margins, the dorsal lobe usually 1—3 mm. longer than the 2 lower lateral (rarely more) and sometimes slightly wider. *Stamens* shortly exserted from the perianth tube and more or less erect with declinate anthers or sometimes longer and subarcuate; filaments 1—1·3 cm. long; anthers 6—7 mm. long. *Ovary* globose, 3—4 mm. long, villous or sericeous above the base; style reaching to base or top of anthers, with spathulate branches 3—5 mm. long, usually conduplicate.

Mountain slopes in the northern area of the Cape Peninsula, the Paarl, Worcester and Ceres Divisions and flats north of Ceres, from 320 to 550 metres altitude.

TYPE. Bot. Mag. t. 576.

Flowering period. July—September.

CAPE. Hills near Cape Town: *Pappe* (21157 in S. Af. Mus.). Lions Head: *MacOwan; Wilms* 3684, 3686; *Zeyher* 5043. Lions Rump: *Prior.* Signal Hill: *Phillips* 25; *Penfold* 93 (52890 in S. Af. Mus.); *Marloth* 189; *Dod* 507; *Wallich; Barker* 441. Devils Peak: *Ecklon* 123 (named *Babiana lilacina*); *Pappe; Bolus* 3808. Above Woodstock: *Arbuthnot.* Above Sea Point: *Dod* 1405. Green Point: *Marloth* 177.

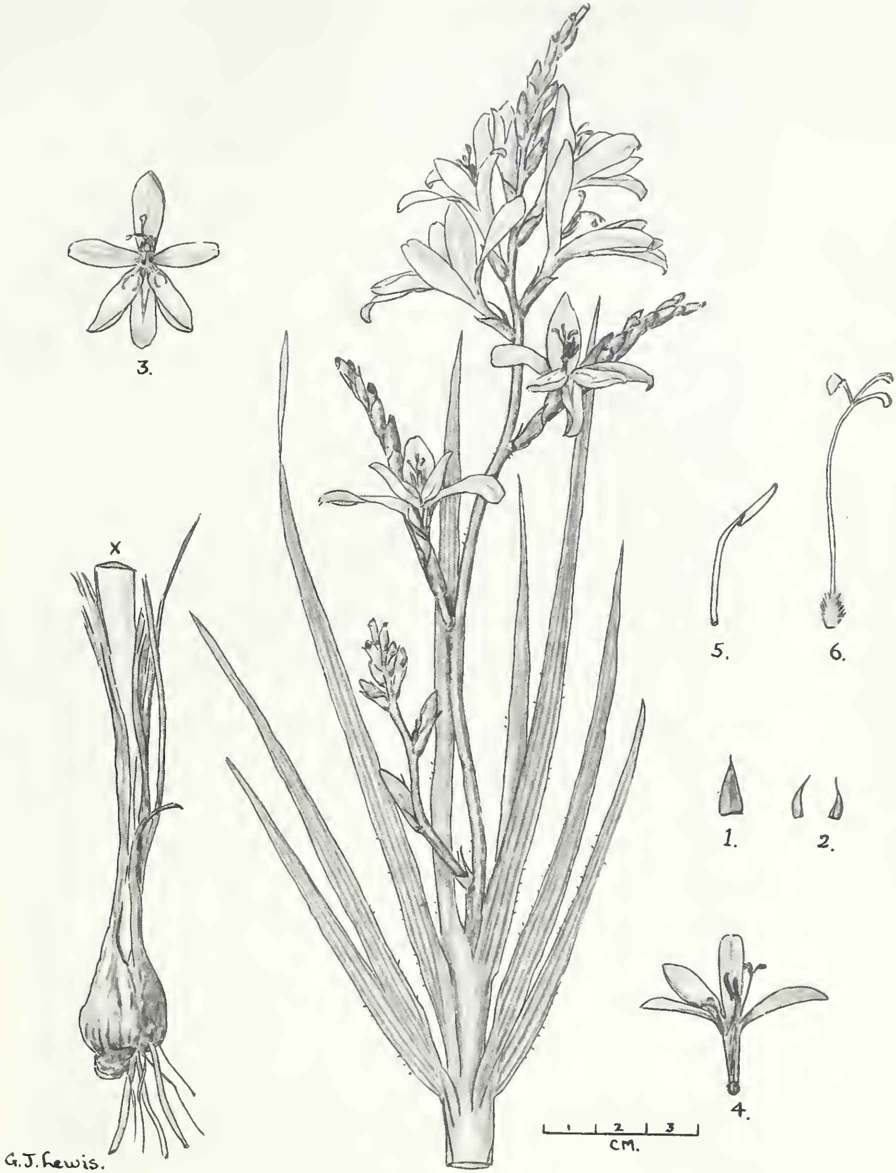

PLATE 9.
B. lineolata Klatt. (Slightly reduced.) Plant from Citrusdal, grown in National Botanic Gardens, Kirstenbosch.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower. 5. Stamen × 2. 6. Gynaecium × 2.

Paarl. Bains Kloof: *Grant* 2249; *Gillett* 133; *Compton* 18269; *Barker* 4648. Agter Paarl: *Loubser* 472.

Worcester. Sebastians Kloof, off Bains Kloof: *Compton* 11638.

Ceres. Michells Pass: *Pearson* (15553 in Herb. Bol.). Ezelsfontein: *Esterhuysen* 20338. Prince Alfreds Hamlet: *Lewis* 2652; *Compton* 11971; *Maguire* 1758; *Walgate* 291. Ceres: *Rogers* 28725. Gydo: *Leipoldt* 3042, 4066.

Without Locality. *Thunberg* (*Gladiolus plicatus* sheet c and left-hand specimen on sheet d); *Burchell; Lindley; Niven* 14; *Bowie* 1, 2; *Jussieu* 3645; *De Candolle; Commerson* (in Herb. Lamarck); *Burmann; Bergius; Lehmann.*

The confusion about this species is explained in a separate note in the introduction to this revision, and a short account of the species is given there. It has been completely misunderstood and in this country the species which must now be known as *Babiana ambigua* (R. & S.) Lewis has generally been named *B. plicata*, although it does not match the type figure nor agree with Ker's description. *B. plicata* is extremely variable and many colour variations and forms occur together on the slopes of Lions Head, Cape Peninsula, some with very short truncate bracts, from which the perianth tube is well exserted, and others with bracts as long as the tube or longer; all have a strong caryophyllaceous scent. In the form from Bains Kloof and the Ceres Division, the flowers are sometimes more distinctly bilabiate than in the Peninsula forms, with the dorsal lobe free and sometimes up to 5 mm. longer than the 3 lower lobes, with which the upper lateral lobes are very shortly united.

13. **B. patersoniae** L. Bolus, S.A. Gard. & Country Life 21: 282(1931).

Corm ovoid, 1·2—2 cm. diam.; tunics of fine reticulate fibres, with a neck 3—6 cm. long. *Stem* erect, 1·5—13 cm. high (usually 2—7 cm.), puberulous, villous or sometimes velutinous, simple or occasionally with 1 short branch. *Leaves* 6—7, usually ascending or suberect, lanceolate, acute or acuminate, fairly firm, sometimes somewhat rigid and pungent, 3—10 cm. long, 3—5 mm. wide, plicate, hispidulous or pubescent. *Spike* short, usually 1—4-flowered, spirally arranged. *Bract* lanceolate or oblong-lanceolate, acute or acuminate, 1·2—3 cm. long, herbaceous, puberulous or pubescent, the apex sphacelate; *bracteoles* free, lanceolate, acuminate, with narrow hyaline margins, shorter than the bract. *Flowers* zygomorphic, more or less bilabiate, purplish blue to very pale blue, occasionally white, the lower lobes usually with a small yellowish area near the middle, fragrant; *perianth tube* slender, very slightly dilated upwards from base to throat with a slight curve shortly below the throat, 2—3 cm. long; *lobes* nearly always shorter than the tube, arising slightly obliquely, 1·4—2·6 cm. long, 4—8 mm. wide, the dorsal 2·5—5 mm. longer than the 3 lower, all oblanceolate, narrow-oblong or obovate-oblong, obtuse, the outer mucronate, slightly narrower than the inner and sometimes partly ciliate on the medial vein outside. *Stamens* erect or suberect with declinate anthers; filaments 0·8—1·2 cm. long; anthers 4—5 mm. long. *Ovary* rotund, 4 mm. long, densely villous or sericeous; style reaching to middle of anthers or above the top, with oblanceolate or spathulate conduplicate branches 3—4 mm. long.

Open sandy places on flats and hills up to 300 metres in the coastal districts from Caledon to Alexandria.

Type. *Paterson* 39 in the Bolus Herbarium.

Flowering period. August—October.

Caledon. Appelskraal, Riviersonderend: *Zeyher* 4001. Riviersonderend: *Walgate* 341; *Pappe* (21146 in S. Af. Mus.); *Stokoe* 8943. Klein River Mountains: *Stokoe* (55719 in S. Af. Mus.).

Bredasdorp. Napier: *Bond* 467. Bontebok Park: *Martin* 580; *Taylor* 310. Potberg: *Mund.* Near Bredasdorp: *Acocks* 15455.

Swellendam. Hill below Crown Mt.: *Wurts* 312.

Mossel Bay. Kleinberg, near Mossel Bay: *Galpin* 4705. Seven and a half miles W. of Mossel Bay: *Acocks* 15401. W. of Mossel Bay: *Gillett* 1167; *Sidey* 1739.

Humansdorp. Lower Zitzikama, between Kromme R. and Palmiet Vlei: *Fourcade* 5377. Near Karedouw: *Fourcade* 1454. Humansdorp: *Galpin* 4703. Near Humansdorp: *Schonland* 3010. Assegai Bosch: *Fourcade* 1454; *Fries, Norlindh* and *Weimarck* 1260, 1286. Jeffreys Bay: *Fourcade* 3308.

Uitenhage. Near Swartkops River: *Ecklon* 159; *Zeyher* 3998. Despatch: *Holland*, N.B.G. 1384/25.

Port Elizabeth. Near Swartkops: *Paterson* 39. Near Green Bushes: *Holland* 3631. Port Elizabeth: *Cory* (20130 in Herb. Bol.); *E.S.C.A. Herb.* No. 299. Bethelsdorp: *Fries, Norlindh* and *Weimarck* 44. Perseverance: *Rodin* 1247.

Alexandria. Near Sand Flats: *Burtt Davy* 14207.

Without Locality. *Mund; Schonland* 3010; *Burmann; Hutton; Thunberg* (*Gladiolus plicatus* sheet b).

This species is very near *Babiana plicata* but the plants are smaller, with narrower and firmer leaves 3—5 mm. or rarely up to 8 mm. wide, fewer flowers in the inflorescence and a longer perianth tube which widens gradually from base to throat, is not infundibuliform and is nearly always longer than the lobes. There is considerable variation in the length and width of the perianth lobes, and in the Port Elizabeth area and near the Riviersonderend Mountains they are comparatively longer and narrower than the more or less oblong to obovate lobes more common in other areas.

Plants of this species from the Uitenhage district were distributed by Ecklon as *B. caerulescens* Eckl. but this name cannot be upheld and must be regarded as a *nomen nudum*, as the extremely brief description is inadequate, the locality given for the species is the Cape Peninsula, and the name was applied by Ecklon to four different species.

There are two notes by N. E. Brown which concern this species. The first, published in Kew Bull. (1929), p. 134, is as follows: "*Ixia flabellifolia* La Roche. There are 4 sheets of specimens bearing this name in Burmann's herbarium. Three of them belong to a species of Babiana that I do not match at Kew, and which do not agree with the description of La Roche, inasmuch as none of them has more than 1 branch to the stem, the tube of the flower is not or scarcely twice as long as the bracts and the style is far exserted from the tube of the flower and much longer than the stamens. Therefore none of these specimens can be the type of *Ixia flabellifolia*". The second note is on the sheet of *Zeyher* 4001 in Kew Herbarium: "Matches *Glad. plicatus* sheet b of Thunberg. This seems to be *Ixia flabellifolia* Burm. herb. but not of La Roche. Compared with Burmann's type. The pubescence on the leaves of Burmann's specimen is short as in these".

14. **B. secunda** (Thunb.) Ker Gen. Irid. 154 (1827); Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895); Baker Handbk. Irid. 184 (1892) and Fl. Cap. 6: 114 (1896). *Gladiolus secundus* Thunb. Prodr. 186 (1800), Naturf-hist. Selsk. Köbenh. 14, t. 4 (1810), and Fl. Cap. 1: 215 (1807–13) and ed. Schultes 54 (1823); Poir. in Lam. Encyc. Suppl. 2: 794 (1812); Roem. & Schult. Syst. 1: 443 (1817). *Babiana reflexa* Eckl. Top. Verz. 33 (1827); non Ker (1827). *B. stricta* (Ait.) Ker var. *reflexa* (Eckl.) Baker, Fl. Cap. 6: 113.

Corm ovoid, about 2 cm. diam.; tunics of reddish brown fibres, with a neck 12·5—15 cm. long. *Stem* usually declinate, 15—35 cm. long, simple or branched, puberulous. *Leaves* 5—6, usually ascending or erect lanceolate, acute, 7—15 cm. long, 0·4—1 cm. wide, plicate, pubescent. *Spike* usually secund or if stem suberect then spirally arranged, long, many-flowered. *Bract* oblong or narrow-oblong, 1—1·3 cm. long, tricuspidate with a long central cusp, herbaceous, glabrous, usually more or less brown, dry and lacerated at time of flowering; *bracetoles* free, lanceolate, cuspidate, 8—9 mm. long. *Flowers* bilabiate, turned to face the stem apex, blue, the lower lateral lobes with a white or pale yellow area in the middle; *perianth tube* curved, 6—8 mm. long, usually with a slight twist; *lobes* arising obliquely, obtuse, tapering slightly from the middle downwards, the outer mucronate, 4—6 mm. wide, the inner 2—3 mm. wider; dorsal lobe free, subarcuate, narrow-oblong, 1·8— 2 cm. long; 3 lower lobes 1·4—1·7 cm. long. *Stamens* arcuate; filaments 1·2—1·4 cm. long; anthers yellow, 6 mm. long. *Ovary* rotund, glabrous, 2·5 mm. long; style reaching to top of anthers, with filiform branches 3—4 mm. long and very small cuneate conduplicate stigmas.

In reddish clay soil on hills and at foot of mountains in the Malmesbury, Hopefield, Tulbagh and Paarl Divisions.

TYPE. *Thunberg*, in Herb. Thunberg, Botanical Museum, Uppsala.

Flowering period. October—November.

HOPEFIELD. Between Oudepost and Hopefield: *Lavis* (20305 in Herb. Bol.).

MALMESBURY. Groenekloof: *Ecklon* and *Zeyher* 129.

TULBAGH. Piketberg Road Station (Gouda): *Bolus* 13652; *Guthrie* 2698. Tulbagh Kloof at foot of Winterhoeksberg: *Ecklon* and *Zeyher*. Saron: *Lewis*.

PAARL. Between Paarl and Pont: *Drege* 8389. Agter Paarl road: *Lewis* 4417. Near Joostenberg, between Durbanville and Paarl: *Esterhuysen* 15984.

WORCESTER. *Zeyher*.

WITHOUT LOCALITY. *Thunberg* (*Gladiolus secundus*); *Ecklon* and *Zeyher* 77.

The long secund spike with flowers facing the apex of the stem and the short, glabrous, brown and more or less lacerated bracts serve to distinguish this species.

15. **B. mucronata** (Jacq.) Ker in Konig & Sims Ann. 1: 234 (1805) and Bot. Mag. sub t. 1019 (1807); Dur. & Sch. Consp. Fl. Afr. 5: (1895). *Gladiolus mucronatus* Jacq. Ic. t. 253 (1786–93) and Coll. 4: 162 (1790); Vahl Enum. 2: 115 (1806); Roem. & Schult. Syst. 1: 439 (1817), pro parte; Poir. in Lam. Encyc. Suppl. 2: 793 (1812).

Corm subglobose, 2·5—3·5 cm. diam.; tunics matted, of fairly coarse brown fibres, with a neck 11—15 cm. long. *Stem* erect or suberect, more or less flexuose, 5—15 cm. high, the lower quarter to half enclosed in the leaves, velutinous or pubescent, usually with 2—3 short suberect branches. *Leaves* 5—7, distichous, usually suberect, ensiform or lanceolate, acute or acuminate, 6—20 cm. long, 0·7—1·5 cm. wide, pubescent, laxly or sometimes fairly firmly plicate. *Spike* distichous, rarely secund, the terminal closely 6—12-flowered and branches 2—8-flowered, the latter often flowering at same time as the terminal. *Bract* oblong or lanceolate, acute, obtuse and mucronate or sometimes irregularly tridentate, 1·5—2·5 cm. long, herbaceous, pubescent, the apex scariose and ferruginous;

bracteoles free, as long as the bract or slightly shorter, lanceolate, acuminate, with narrow hyaline margins. *Flowers* bilabiate, scentless, the 3 upper lobes pale mauve, the 3 lower yellow or yellow with the upper half mauve; *perianth tube* slender, narrowly infundibuliform above the middle, usually slightly curved near the throat, 1·5—2 cm. long; *lobes* unguiculate or subunguiculate, obtuse or sometimes retuse, the outer mucronate, sometimes with a fairly long mucro, and partly ciliate on the medial vein outside; dorsal lobe free, spathulate, oblanceolate or oblong-oblanceolate, 2·3—3·5 cm. long, 0·7—1·1 cm. wide; upper lateral lobes shortly united with the 3 lower in a lip, oblanceolate, 2—3 cm. long, 3—6 mm. wide; 3 lower lobes 1·5—2·7 cm. long, united for 2—3 mm., the lowest oblanceolate, 3—6 mm. wide, the 2 lateral shortly unguiculate with an oblong or narrow-oblong blade 5—8 mm. wide with inflexed undulate margins below the middle and the upper half recurved. *Stamens* nearly erect or subarcuate; filaments 1·3—1·6 cm. long; anthers 5—7 mm. long. *Ovary* rotund, 3—4 mm. long, sericeous; style reaching to middle or top of anthers, with conduplicate oblanceolate or spathulate branches 4—5 mm. long.

Flats and mountain slopes from 100 to 500 metres in the Piketberg, Tulbagh and Clanwilliam Divisions.

TYPE. Jacquin Ic. t. 253.

Flowering period. July—September.

PIKETBERG. Top of Cardouw Pass: *Lewis* 3569; *Barker* 8112. Zebrakop: *Pillans* 7272. Top of Piketberg Mt.: *Martin* 860; *Barker* 6717. Near Witte Water, 10 miles W. of Piketberg on Velddrift road: *Lewis* 1893. Kapiteins Kloof: *Stokoe* (59881 in S. Af. Mus.); *Pillans* 7703. Near Redlinghuis: *Lewis* 2198. Fourteen miles N. of Piketberg: *Barker* 7326; *Lewis* 2199. Lamberts Hoek Berg: *Barker* 6705. Farm Mouton Valley, Piketberg: *Marloth* 11467.

CLANWILLIAM. Olifants River Mountains, behind Warm Baths: *Pearson* 7070; *Stephens* 7090, 7092, 7095. Top of Greys Pass: *Lewis* 1892; *Steyn* 370. Nine miles N. of Citrusdal: *Barker* 6412; *Lewis* 2200. Between Citrusdal and Clanwilliam: *L. Bolus* (23187 in Herb. Bol.). Top of Uitkyk Pass: *Salter* 7581; *Esterhuysen* 20591; *Lewis* (22247 in Herb. Bol.). Upper N. face of Schimmelberg: *Pillans* 9105.

TULBAGH. Old Witzenberg pass, amongst rocks at summit: *Esterhuysen* 20671.

Baker took *Babiana scabrifolia* Brehm. ex Klatt to be the same as *B. mucronata* and the plants described and cited by him under *B. mucronata* in the Flora Capensis are partly *B. scabrifolia* (*Drege* 2623) and partly *B. stenomera* Schltr. (*Drege* 2624), while his var. *longicollis* is *B. sambucina* (Jacq.) Ker.

B. mucronata (Jacq.) Ker var. **longituba** Lewis var. nov.

Folia dense pubescentia pilis brevibus et longis. *Perianthii tubus* plerumque 2—2·5 cm. longus.

Leaves densely pubescent with short and long hairs. *Perianth tube* usually 2—2·5 cm. long.

Mountain slopes in the Clanwilliam Division.

Type. *Barker* 3090 in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August—October.

Clanwilliam. Elandskloof: *Barker* 3090; *Lewis* 1362; *Stokoe* (68293 in S. Af. Mus.); *Compton* 20973; *Hafstrom* and *Acocks* 273. Cedarberg: *Thode* A 2084; *Stokoe* (63468 in S. Af. Mus.).

B. mucronata (Jacq.) Ker var. **minor** Lewis var. nov.

Plantae quam var. *mucronata* minores caule ad 5 cm. longo. *Folia* lanceolata vel lineari-lanceolata, 4·5—6 cm. longa, 1·5—4 mm. lata, laxe vel firme plicata, pubescentia vel velutina. *Bractea* lanceolata, acuta, circa 1·5 cm. longa, pubescens, basin versus dense villosa. *Flores* var. *mucronatae* similes sed minores; *perianthii tubus* 1·2—1·5 cm. longus et segmentum dorsale 2—2·2 cm. longum.

Plants smaller than in var. *mucronata*, the stem up to 5 cm. long. *Leaves* lanceolate or linear-lanceolate, 4·5—6 cm. long, 1·5—4 mm. wide, laxly or firmly plicate, pubescent or velutinous. *Bract* lanceolate, acute, about 1·5 cm. long, pubescent, densely villous at the base. *Flowers* as in var. *mucronata* but much smaller, the perianth tube 1·2—1·5 cm. long and dorsal lobe 2—2·2 cm. long.

Apparently very local on the Giftberg in the Vanrhynsdorp Division.

Type. *Acocks* 14905 in the National Herbarium, Pretoria.

Flowering period. September.

Vanrhynsdorp. Giftberg Plateau: *Acocks* 14905.

16. **B. odorata** L. Bolus (Plate 10), S.A. Gard. & Country Life 22: 243 (1932).

Corm ovoid or subglobose, 1·5—2·5 cm. diam.; tunics matted, of fairly coarse brown or reddish brown fibres, with a neck 7—10 cm. long. *Stem* erect or declinate, often flexuose, 3—12 cm. long, pubescent or villous, simple or with 1—3 short suberect branches. *Leaves* 5—7, distichous, spreading fan-wise, lanceolate, ensiform or oblong-ensiform, acute, laxly or sometimes fairly firmly plicate, pubescent, 4—10 cm. long, 0·8—2 cm. wide. *Spike* distichous or secund, closely 3—8-flowered. *Bract* oblong or oblong-lanceolate, acute, obtuse or truncate, sometimes unequally tridentate, 1·5—2·5 cm. long, herbaceous, pubescent or villous, the apex

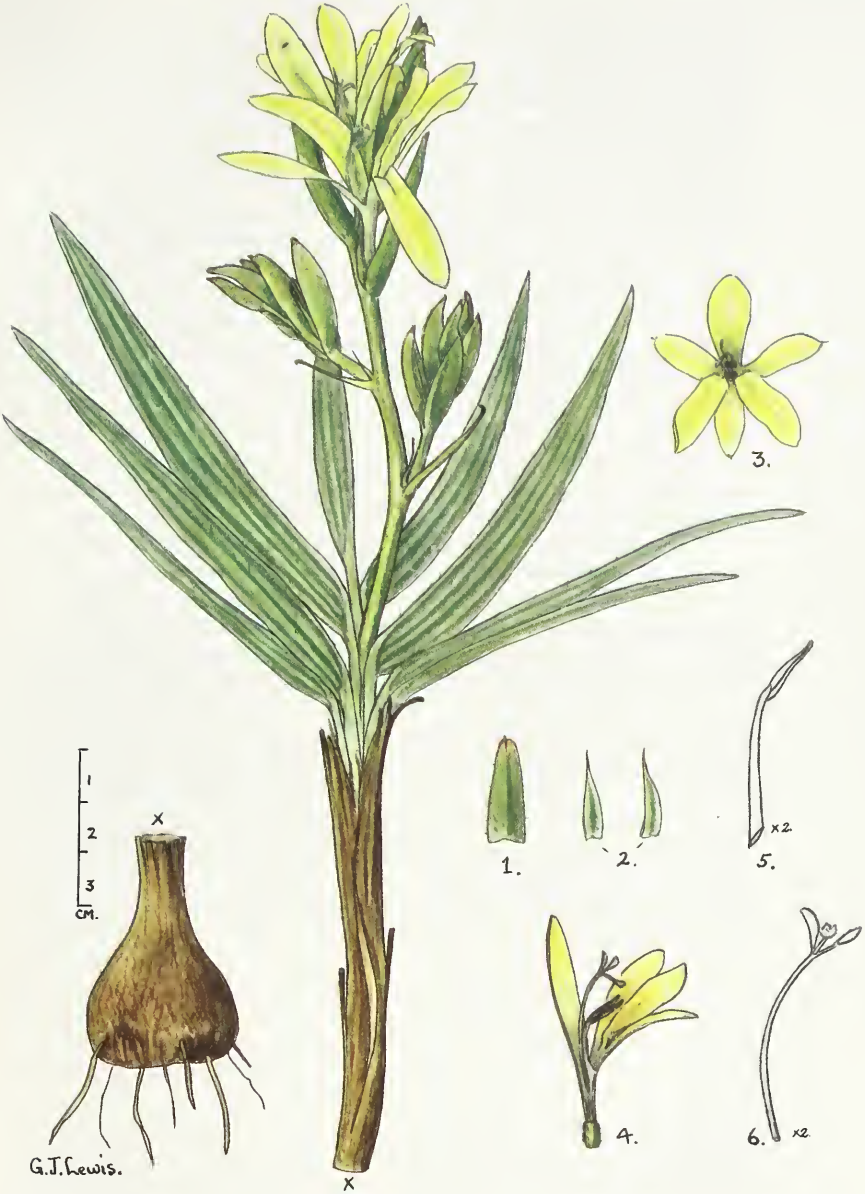

Plate 10.

B. odorata L. Bolus. (Slightly reduced.) Plant from Kalabas Kraal, Malmesbury Division.

1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower. 5. Stamen × 2. 6. Style and style branches × 2.

scariose and ferruginous; *bracteoles* free, as long as the bract or slightly shorter, lanceolate, acuminate, with narrow hyaline margins. *Flowers* bilabiate, fragrant, yellow or creamy yellow, the perianth tube bluish green and outer lobes often greenish outside; *perianth tube* usually straight, 1—1·4 cm. long, the upper half narrowly infundibuliform; *lobes* unguiculate or subunguiculate, obtuse or retuse, the outer mucronulate or very shortly mucronate and partly ciliate on the medial vein outside; dorsal lobe free, subarcuate, spathulate, oblanceolate or oblong-oblanceolate, 2·6—3·4 cm. long, 0·6—1 cm. wide; upper lateral lobes shortly united with the 3 lower in a lip, oblanceolate, 2·2—2·8 cm. long, 4—7 mm. wide; 3 lower lobes 2—2·2 cm. long, united for 2—3 mm., the lowest more or less oblanceolate, 4—7 mm. wide, the 2 lateral shortly unguiculate with an oblong or oblanceolate blade 4—8 mm. wide with inflexed undulate margins below the middle. *Stamens* arcuate; filaments 1·4—1·7 cm. long; anthers 5—6 mm. long. *Ovary* oblong, 3—4 mm. long, densely villous or sericeous above the base; style reaching to base or top of anthers, with conduplicate oblanceolate or spathulate branches 4—5 mm. long.

Flats, hills and low mountain slopes in the coastal districts from Bellville to Piketberg and in the Tulbagh and Paarl Divisions.

LECTOTYPE. *Schlechter* 10725 in the Bolus Herbarium.

Flowering period. July—September.

PIKETBERG. Near Porterville: *Schlechter* 10725. Rhinosterfontein, Langevallei: *Drege* 8398, 8398 b. Near Berg River Bridge: *L. Bolus*, N.B.G. 1809/32. De Hoek: *Stokoe* (59879 in S. Af. Mus.). Porterville: *Schlechter* 4884.

TULBAGH. Near Twenty-four Rivers: *MacOwan*, H.N.A.Af. 543. Tulbaghskloof (Nieuwekloof), at foot of Wintershoekberg, on the Witsenberg and Vogelvalei: *Ecklon* 77.9.

MALMESBURY. Moorreesburg: *L. Bolus* (20199 in Herb. Bol.). Between Hopefield and Koperfontein: *Lewis* 4802. Riebeckskasteel: *Zeyher* 1616. Kalabas Kraal: *Garabedian* (50376 in S. Af. Mus.); *Bond* 1042. Between Koperfontein and Malmesbury: *Barker* 4068. Malmesbury: *L. Bolus* (20199 in Herb. Bol.); *Lewis* 1891, 2205; *Barker* 6188; *Middlemost*, N.B.G. 1247/33.

PAARL. Near Paarl: *Salter* 1332. Between Paarl Mountains and Paardeberg: *Drege*. Near Wellington: *Grant* 2359.

BELLVILLE. Adderley Farm, north of Tygerberg: *Barker* 4805. Phesante Kraal: *Van Niekerk* 163.

Some of the older collections of this species were confused with *Babiana mucronata* and others with *B. stricta* var. *sulphurea*, though it differs markedly from the latter in having distinctly zygomorphic bilabiate flowers. It is very closely allied to *B. mucronata*, however, and only distinguished by the different colour of the flowers, which are very fragrant (scentless in *B. mucronata*), the slightly shorter perianth tube and the outer lobes being very shortly and inconspicuously mucronulate. The leaves are more widely spread in *B. odorata*, and another character which distinguishes these species is the set of the 3 lower perianth lobes which spread from the base in *B. odorata*, whereas in *B. mucronata* the lower half is suberect and the upper half more or less recurved or patent. When dried the flowers of *B. odorata* turn a reddish brown colour with age.

17. **B. patula** N. E. Br., Gard. Chron. No. 2400, 92: 466 (1932).

Corm ovoid or subglobose, 1·5—3 cm. diam.; tunics thickly matted, of fairly coarse brown fibres, with a hard, dark brown, narrowly cylindrical neck 8—10 cm. long. *Stem* erect or somewhat declinate, usually 2—8 cm. high, pubescent, simple or with 1—3 short suberect branches. *Leaves* 6—8, distichous, usually widely divergent and often slightly upcurved, lanceolate, acuminate, 5—10 cm. long, 3—9 mm. wide, plicate, pubescent, sometimes velutinous or pilose. *Spike* distichous, fairly closely 3—9-flowered. *Bract* lanceolate, acute, bifid or irregularly trifid, 1—2 cm. long, herbaceous, pubescent, the apex usually scariose and ferruginous; *bracteoles* free, slightly shorter than the bract, with hyaline margins, the apex acuminate, ferruginous. *Flowers* bilabiate, pale mauve or bluish mauve, the lower lateral lobes yellow usually tipped with mauve, or sometimes the whole flower dull creamy yellow, fragrant; *perianth tube* 1—1·4 cm. long, curved shortly below the throat and slightly widened above the curve; *lobes* subunguiculate, obtuse or occasionally retuse, the outer mucronate or mucronulate; dorsal lobe free, spathulate, cuneately oblanceolate or oblong-oblanceolate, subarcuate, 2—3 cm. long, 0·7—1·1 cm. wide; upper lateral lobes shortly united with the 3 lower in a lip, oblanceolate or cuneately oblanceolate, 1·5—2·5 cm. long, 4—5 mm. wide; 3 lower lobes 1·3—2·2 cm. long, united for about 2 mm., the lowest oblanceolate or cuneately oblanceolate, 4—5 mm. wide, the 2 lateral oblong or cuneately obovate, 5—7 mm. wide, with inflexed undulate margins below the middle. *Stamens* arcuate; filaments 1·2—1·4 cm. long; anthers 6 mm. long. *Ovary* oblong, 3—4 mm. long, glabrous or sometimes puberulous on the ribs; style reaching to middle or top of anthers, with conduplicate clavate or spathulate branches 3—4 mm. long.

Flats, hills and lower mountain slopes from the Tulbagh to Montagu Divisions and southern coastal districts from Caledon to Riversdale.

TYPE. *Muir* 4852 in the Kew Herbarium.

Flowering period. August—September.

TULBAGH. Kluitjieskraal: *Tyson,* H.N.A.Af. 1542.

WORCESTER. Boschejesveld Mountains: *Stokoe* (68586 in S. Af. Mus.).

MONTAGU. Kogmans Kloof: *Morris* 172. Montagu: *Cook*, N.B.G. 1655/22.

CALEDON. Swartberg: *Zeyher* 4002 a. Five miles N.W. of Riviersonderend: *Heginbotham* 101. Fourteen miles E. of Caledon on road to Swellendam: *Story* 3076.

BREDASDORP. Eleven miles S.W. of Bredasdorp: *Salter* 4847. Near the Poort: *Barker* 2518. South end of Zoetendals Vlei: *Acocks* 15485. Napier: *Compton* 8976. Uintjieskuil: *Smith* 3180. Vogel Vlei: *Dymond*, N.B.G. 1849/33, partly.

SWELLENDAM. Between Storms Vlei and Bonnievale: *Zeyher* 4002 b. Breede River, near Swellendam: *Drege*. East of Swellendam: *Barker* 7338. Foot of Langeberg, near Swellendam: *Wurts* 253, 272.

HEIDELBERG. Near Heidelberg: *Barker* 5568.

RIVERSDALE. Keurfontein, near Albertinia: *Muir* 1769. Onverwacht: *Muir* 1606. Near Riversdale: *Muir* 4852; *Rogers* 4397, partly. Oakdale, near Riversdale: *Galpin* 5460. Still Bay hills: *Barker* 7360.

This species is closely allied to *B. mucronata* but has different corm tunics with the neck fibres always more or less compacted together into a firm narrow cylinder, also slightly smaller flowers and the ovary glabrous or at most puberulous on the ribs. Plants collected by Barker on the Still Bay hills are much taller than usual, up to 20 cm. high, with more erect leaves and larger flowers, and were probably growing among bushes. The leaves of Tyson's specimens from Kluitjieskraal are sparsely pilose, but both long and short hairs, sometimes intermingled, have been observed in a few specimens from the Montagu and Bredasdorp Divisions.

In the Bolus Herbarium one of the specimens of *Dymond*, N.B.G. 1849/33, from the Bredasdorp Division, is *B. patersoniae* L. Bolus, and there are indications that some of the others on the same sheet are hybrids between *B. patersoniae* and *B. patula*.

18. **B. montana** Lewis sp. nov.

Cormus globosus, circa 2·5 cm. diam., tunicis concretis e fibris brunneis sat robustis in collo fusco rigido cylindrico 8—10 cm. longo productis, compositis. *Caulis* brevis, suberectus, villosus, simplex vel ramo 1 brevissimo. *Folia* 6—7, disticha, patentia vel suberecta, lanceolata, acuminata, 6—10 cm. longa, 5—9 mm. lata, plicata, pubescentia. *Spica* disticha, dense 4—5-flora. *Bractea* lanceolata, 2·8—3·8 cm. longa, herbacea, dense villosa, apice scariosa et ferruginosa, bifida; *bracteolae* liberae, acuminatae, quam bractea circa 5 mm. breviores. *Flores* bilabiati, pallide lilacini, parte dimidia inferiore segmentorum lateralium inferiorum pro parte majore lutea basin versus macula W-formata purpureo-notata; *perianthii tubus* cylindricus leviter ad fauces ampliatus, 1·7—2 cm. longus; *segmenta*

oblique orta, lanceolata, obtusa vel subacuta, exteriora plerumque mucronulata, 2·5—3·5 cm. longa, medium versus 5—7 mm. lata, dorsale liberum quam 3 inferiores 3—4 mm. longius. *Stamina* subarcuata, inaequales uno quam cetera longiore, filamentis 0·7—1 cm. longis antherisque 7 mm. longis. *Ovarium* ovoideum, 3 mm. longum, glabrum; stylus ad medium vel apicem antherarum attingens, ramis circa 3 mm. longis apice stigmatifero sat grandi, orbiculari, crenulato, plus minusve plano.

Corm globose, about 2·5 cm. diam.; tunics matted, of fairly coarse brown fibres, with a dark brown somewhat compact hard cylindrical neck 8—10 cm. long. *Stem* short, suberect, villous, simple or with 1 very short branch. *Leaves* 6—7, distichous, patent to suberect, lanceolate, acuminate, 6—10 cm. long, 5—9 mm. wide, plicate, pubescent. *Spike* distichous, closely 4—5-flowered. *Bract* lanceolate, 2·8—3·8 cm. long, herbaceous, densely villous, the apex scariose, ferruginous, bifid; *bracteoles* free, acuminate, about 5 mm. shorter than the bract. *Flowers* bilabiate, pale mauve, the lower half of the lower lateral lobes mostly yellow with a purple W-shaped mark at the base; *perianth tube* cylindrical, slightly widened to the throat, 1·7—2 cm. long; *lobes* arising obliquely, the dorsal free, all lanceolate, obtuse or subacute, the outer usually mucronulate, 2·5—3·5 cm. long, 5—7 mm. wide near the middle, the 3 lower 3—4 mm. shorter than the dorsal. *Stamens* subarcuate, unequal, one longer than the others; filaments 0·7—1 cm. long; anthers 7 mm. long. *Ovary* ovoid, 3 mm. long, glabrous; style reaching to middle or top of anthers, the branches about 3 mm. long, with fairly large more or less flattened orbicular crenulate stigmas.

Rocky mountain ridges, hills and swamps in the Caledon Division.

TYPE. *Zeyher* 4003 in the Bolus Herbarium.

Flowering period. June—August.

CALEDON. Kleinriviersberge: *Zeyher* 4003.

BREDASDORP. Wydgelegen: *Barker* 4565.

The species is described from Zeyher's specimens, the only recent collection which matches them being that of Miss Barker. *Zeyher* 4003 was distributed to a number of herbaria, and specimens from Kew, the Natural History Museum, Paris, Zürich University, the Bolus Herbarium and National Herbarium, Pretoria, have been examined. In these herbaria they have been variously identified as *B. disticha*, *B. obtusifolia* and *B. plicata*, but the combined characters of the corm, bracts, unequal stamens and large stigmas distinguish this from all other known species.

19. **B. ambigua** (Roem. & Schult.) Lewis comb. nov. (Plate 11). *Gladiolus ambiguus* Roem. & Schult. Syst. 1: 446 (1817). *G. mucronatus*

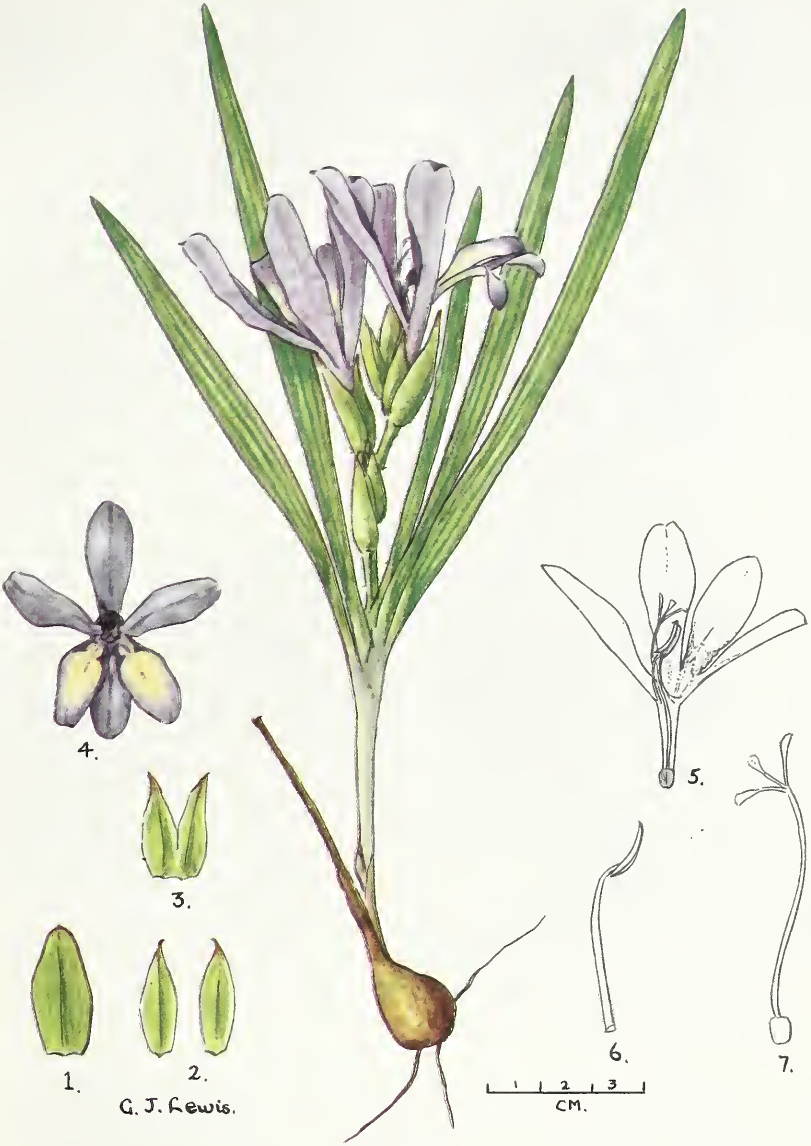

Plate 11.
B. ambigua (Roem. & Schult.) Lewis. (Slightly reduced.) Plant from mountain slopes at Kirstenbosch, among bushes.
1. Bract. 2. Bracteoles. 3. Bracteoles, partly united. 4. Flower, front view. 5. Section of flower. 6. Stamen × 2. 7. Gynaecium × 1½.

Lam. Illustr. 1: 119 (1791); non Jacq. (1786–93). *Babiana plicata* Baker Handbk. Irid. 183 (1892) and Fl. Cap. 6: 112 (1896), pro parte, excl. syn.; non Ker (1802); Eckl. Top. Verz. 31 (1827); Lewis in Adamson & Salter Fl. Cap. Pen. 244 (1905), pro parte.

Corm globose or subglobose, 1—1·5 cm. diam.; tunics usually few, of fairly fine brown reticulate fibres; neck wanting or if present then thin, somewhat sparse and rarely entirely enclosing the stem. *Stem* short, erect, declinate or sometimes decumbent, pubescent, simple or occasionally with 1—2 very short branches, the subterranean part 4—15 cm. long, usually with small clusters of cormlets in the leaf axils, the aerial part 1—5 cm. long. *Leaves* 3—6, erect or suberect, overtopping the flowers, linear or lanceolate, acute or acuminate, more or less plicate, pubescent, usually 4—8 cm. long, 0·3—1 cm. wide. *Spike* short, compact, distichous or secund, usually 4—5-flowered. *Bract* ovate, ovate-oblong or oblong-lanceolate, somewhat ventricose, acute or obtuse, 1·5—3 cm. long, herbaceous, pubescent or puberulous, the apex sometimes brown; *bracteoles* lanceolate, acuminate, as long as the bract or slightly shorter, with fairly wide hyaline margins, free or occasionally shortly united at the base. *Flowers* bilabiate, fragrant, blue or mauve-blue, the lower lateral lobes with a small or large white or pale yellow area usually subtended by a purple W-shaped mark; *perianth tube* 1—1·9 cm. long, slightly widened from the middle up, the throat usually minutely hispidulous inside; *lobes* unguiculate or subunguiculate, lanceolate, oblanceolate, oblong-oblanceolate or sometimes spathulate, obtuse or retuse, the outer mucronate or mucronulate and usually more or less ciliate on the medial vein outside; dorsal lobe free, 2·8—4 cm. long, 0·8—1·3 cm. wide; upper lateral lobes shortly united with the 3 lower in a lip, 2·3—3·5 cm. long, 0·6—1 cm. wide; 3 lower lobes 2—2·8 cm. long, 0·6—1 cm. wide, united for 1—5 mm., the 2 lateral usually oblong above the claw and slightly wider than the lowest, with the margins undulate below the middle. *Stamens* arcuate; filaments 1·3—1·6 cm. long, with minute hyaline hairs at the base; anthers 6—8 mm. long. *Ovary* oblong or rotund, 3—4 mm. long, glabrous or occasionally puberulous on the ribs above the base; style reaching to top of anthers or slightly above, with conduplicate spathulate or cuneate-spathulate branches 5—6 mm. long.

Common on sandy flats and lower mountain slopes in the south-western districts of the Cape Province.

TYPE. Specimen named *Gladiolus mucronatus* in Herb. Lamarck, Natural History Museum, Paris.

Flowering period. July—September.

VANRHYNSDORP. Klaver: *Andreae* 520; *L. Bolus*, N.B.G. 1848/32;

Lewis 1886; *Compton* 20698. Heerenlogementberg: *Esterhuysen* 5559. Windhoek: *Schlechter* 8337.

CLANWILLIAM. Zwartboschkraal: *Schlechter* 5163. Clanwilliam: *Mader* in Herb. MacOwan 2208. Pakhuis Pass: *Martin*, N.B.G. 1771/31. Ten miles N. of Citrusdal: *Lewis* 1363. Five miles N. of Citrusdal: *Barker* 3601. Elands Kloof: *Compton* 17342, 20982; *Stokoe* (68294 in S. Af. Mus.). Sandveld between Greys Pass and Clanwilliam: *Leipoldt* 3536.

PIKETBERG. Kapieteins Kloof: *Stokoe* & *Lewis* (59863 in S. Af. Mus.). Twenty-one miles N. of Piketberg on Redlinghuis road: *Lewis* 2201; *Barker* 6362. Bergvallei: *Drege* 2622. Berg River: *Steyn* 576. Pikeniers Kloof: *Penther* 664.

HOPEFIELD. Near Hopefield: *Bolus* 12846.

MALMESBURY. Malmesbury Commonage: *Lewis* 5228; *Bachmann* 651, partly.

BELLVILLE. Ten miles S. of Mamre: *Davis* (59872 in S. Af. Mus.). Melkbosstrand road: *Barker* 1784. Twenty-three miles from Cape Town on Mamre road: *Barker* 4100. Eighteen miles from Cape Town on Melkbosstrand road: *Lewis* 1065.

CAPE. Camps Bay: *Letty* 18; *MacOwan* 2559. Sea Point: *Dod* 1406. Above Bantry Bay: *Smith* 2879, 2933. Signal Hill: *Marloth* 5663; *Wilms* 3682; *Bolus*. Table Mt.: *Rehmann* 1203. Oranjezicht: *Penfold* 100. Devils Peak: *Wilms* 3682, partly. Rosebank: *Bolus* 7284. Kirstenbosch: *Barker* 1581; *Esterhuysen* 11826. Constantia: *Ecklon* and *Zeyher* 85, partly (named *Babiana caerulescens* Eckl.).

CERES. Cold Bokkeveld, near Elands Kloof: *Leighton* 1283. Leeuwrivier: *Lewis* 1337; *Compton* 17358. Near Leeuwrivier: *Lewis* 2645; *Johnson* 511.

WORCESTER. Orchard, Hex River Valley: *Esterhuysen* 10289.

PAARL. Paarl Mountains: *Drege* 8396. Between Paarl Mountains and Paardeberg: *Drege*. Dal Josaphat, near Wellington: *Grant* 2328. Agter Paarl: *Barker* 443.

STELLENBOSCH. Faure flats: *Martley*. Stellenbosch: *Sanderson* 951.

CALEDON. Villiersdorp: *Barker*. Steenbras: *Rogers* 11204, 11206. Genadendal: *Pappe* (21142 in S. Af. Mus.), partly. Top of Shaws Pass: *Lewis* 3570.

BREDASDORP. Potteberg: *Esterhuysen* 23173. Bredasdorp: *Compton* 9014.

ROBERTSON. Near Robertson: *Barker* 5388.

RIVERSDALE. Near Riversdale: *Rogers* 4397, partly.

WITHOUT LOCALITY. *Lamarck* (named *Gladiolus mucronatus*); *Jussieu* 3602, partly; *Burmann; Linnaeus* (top specimen on sheet 59.5).

This species is one of the commonest in the south-western districts

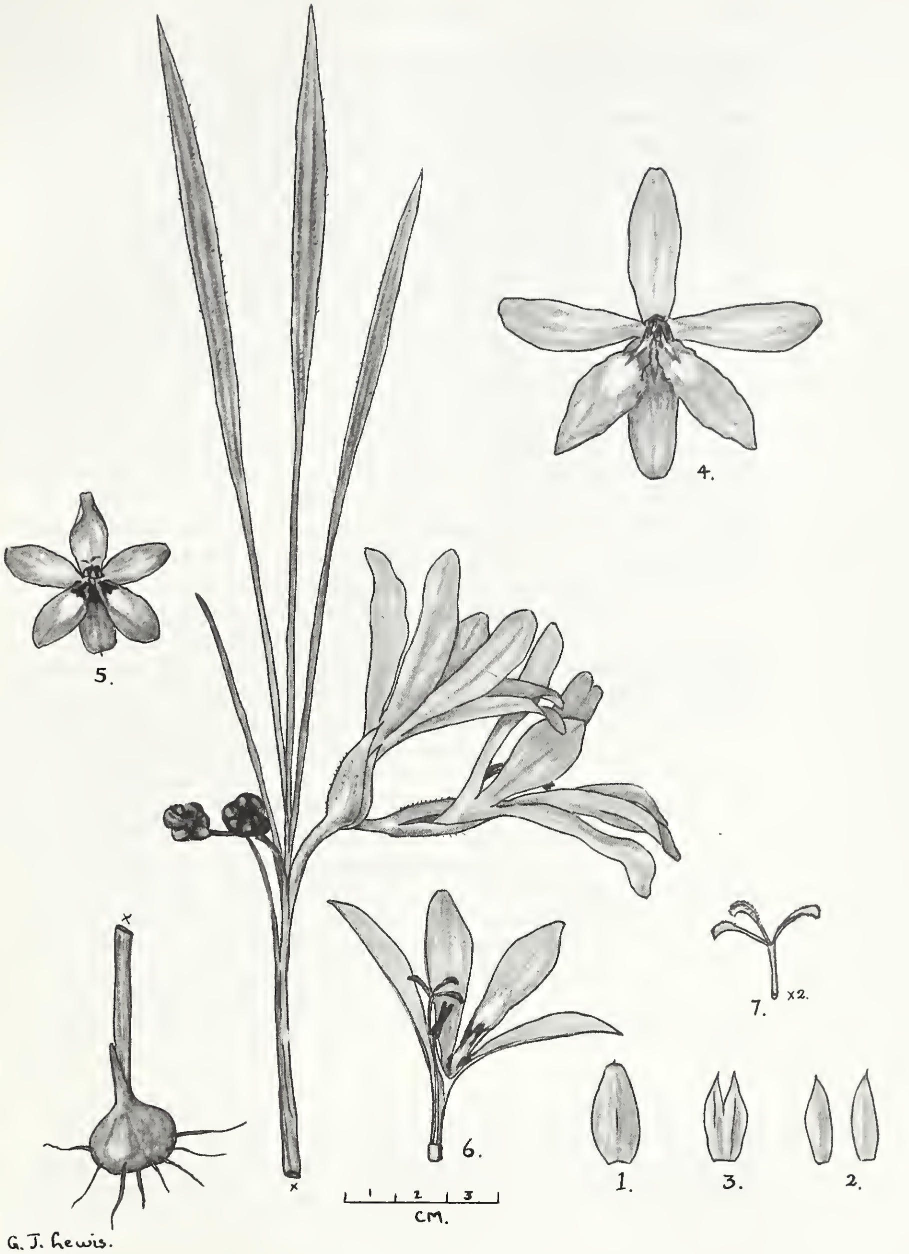

PLATE 12.
B. ambigua × *nana* var. *angustifolia*. (Slightly reduced.) Plant from near Yserfontein.
1. Bract. 2. Bracteoles. 3. Bracteoles, partly united. 4. Flower, front view. 5. Flower from a different plant, front view. 6. Section of flower. 7. Top of style and style branches × 2.

of the Cape Province, with a wide range of distribution, and like most of the commoner species it has been completely misunderstood and confused with other species. In many herbaria it has been named *Babiana plicata* Ker, and has generally been known by that name in this country, but it does not match the type figure of *B. plicata* nor agree with Ker's description. The plant is much smaller, with the short compact spike almost always produced at or very shortly above the ground surface, and the flowers are very different, distinctly bilabiate, with a shorter perianth tube and comparatively longer and much more irregular lobes which are usually at least twice as long as the tube, the stamens and style arcuate, and different markings on the lower lateral lobes. *B. nana* var. *angustifolia*, which has the same habit and bears a close superficial resemblance to *B. ambigua*, has often been confused with it and has also been named *B. plicata* in various herbaria. From the specimens cited by Baker in the Flora Capensis and those I have seen in Kew and herbaria in Europe identified by him as *B. plicata*, it is evident that Baker took *B. villosula*, *B. ambigua* and *B. nana* var. *angustifolia* to be conspecific. In the Linnaean Herbarium there is one specimen of *B. ambigua* added to one of the sheets of *Gladiolus plicatus* L. and some of the confusion is probably due to this misidentification. (See note on *G. plicatus* L. and *Babiana plicata* Ker in the introduction to this revision.)

Lamarck identified the specimen in his herbarium with *Gladiolus mucronatus* Jacq. but in 1817 Roemer and Schultes pointed out this error and gave the name *G. ambiguus* to Lamarck's plant and their specific epithet is now adopted for this species.

The following hybrids have been recorded:—

B. ambigua x **nana.**

HOPEFIELD. Near Hopefield: *Bachmann* 2015.

BELLVILLE. Ten miles S. of Mamre: *Barker* 442.

B. ambigua x **nana** var. **angustifolia** (Plate 12).

MALMESBURY. Near Ysterfontein: *Barker* 444; *Lewis* 113. Between Darling and Ysterfontein: *L. Bolus* (20287 in Herb. Bol.).

BELLVILLE. Groot Springfontein: *Wasserfall* 233.

CAPE. Klaver Valley, Cape Peninsula: *Lewis* 54.

B. ambigua x **scabrifolia.**

CLANWILLIAM. Five miles W. of Clanwilliam: *Lewis* 1887. Graafwater: *Compton* 24214.

20. **B. obliqua** Phillips, Fl.. Pl. of S. Afr. 9, p. 357 (1929).

Corm ovoid, about 2 cm. diam.; tunics of fine brownish reticulate fibres; neck wanting or loose and sparse and not entirely enclosing the stem. *Stem* erect, flexuose, pubescent with more or less retrorse hairs, simple, about 16 cm. long. *Leaves* 3, with long green petioles 2 mm. wide extending 3—10 cm. above ground, pilose towards the top, the blade erect, arising very obliquely with the lower half developed only on one side of the middle vein, 4·5—9 cm. long, 1—2 cm. wide, puberulous, not plicate. *Spike* distichous, fairly closely 4-flowered. *Bract* lanceolate, subacute, herbaceous, puberulous, 3—4 cm. long; *bracteoles* free, about as long as and similar to the bract but narrower, acuminate, with hyaline ciliate margins. *Flowers* bilabiate, lilac-coloured, the lower lateral lobes with a yellow patch below the middle subtended by a purple W-shaped mark; *perianth tube* 1·8—2 cm. long, the upper half infundibuliform, sparsely and minutely hispidulous near the throat inside; *lobes* more or less lanceolate, subunguiculate, acute or subacute, the outer mucronate, all undulate especially the lower lateral; dorsal lobe free, up to 5 cm. long, 9 mm. wide near the middle; upper lateral lobes shortly united with the 3 lower in a lip, slightly shorter and narrower than the dorsal; 3 lower lobes up to 4 cm. long, united for 1—2 mm., somewhat narrower than the 3 upper. *Stamens* subarcuate; filaments 1·5 cm. long; anthers 7—7·5 mm. long. *Ovary* oblong, 4—5 mm. long, glabrous; style reaching to top of anthers, with spathulate conduplicate branches 3 mm. long.

Coastal dunes in the Clanwilliam, Hopefield and Malmesbury Divisions.

TYPE. *Nouhuys*, No. 8180 in the National Herbarium, Pretoria.

Flowering period. July.

CLANWILLIAM. Lamberts Bay: *Nouhuys*, Nat. Herb. Pretoria 8180.

HOPEFIELD. Kotze: *Lewis* 1054.

MALMESBURY. Mamre hills: *Barker* 4607.

Little is known of this species and the variations which may occur. It was described and figured from plants collected on sand dunes about 20 yards from the high-water mark at Lamberts Bay and grown in the garden of the National Herbarium, Pretoria. It is closely allied to *B. scabrifolia* but distinguished by the different corm tunics which do not form a neck, the long petioles and very oblique blades. From *B. ambigua* it differs in the leaves, the longer stem with the spike well above ground, and somewhat larger flowers with comparatively longer, narrower and more tapering lobes. Two specimens which match the type fairly well and have accordingly been placed here, are from about 10 miles inland, growing in white coastal sand, but there is only one specimen from each locality.

21. **B. scabrifolia** Brehm. ex Klatt (Plates 13 & 14), Abhr. Naturf. Ges. Halle 12: 349 (1882) and Erganz. 15 (1882); Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895). *B. mucronata* Baker Handbk. Irid. 183 (1892) and Fl. Cap. 6: 111 (1896), pro parte; non Ker (1805). *B. occidentalis*

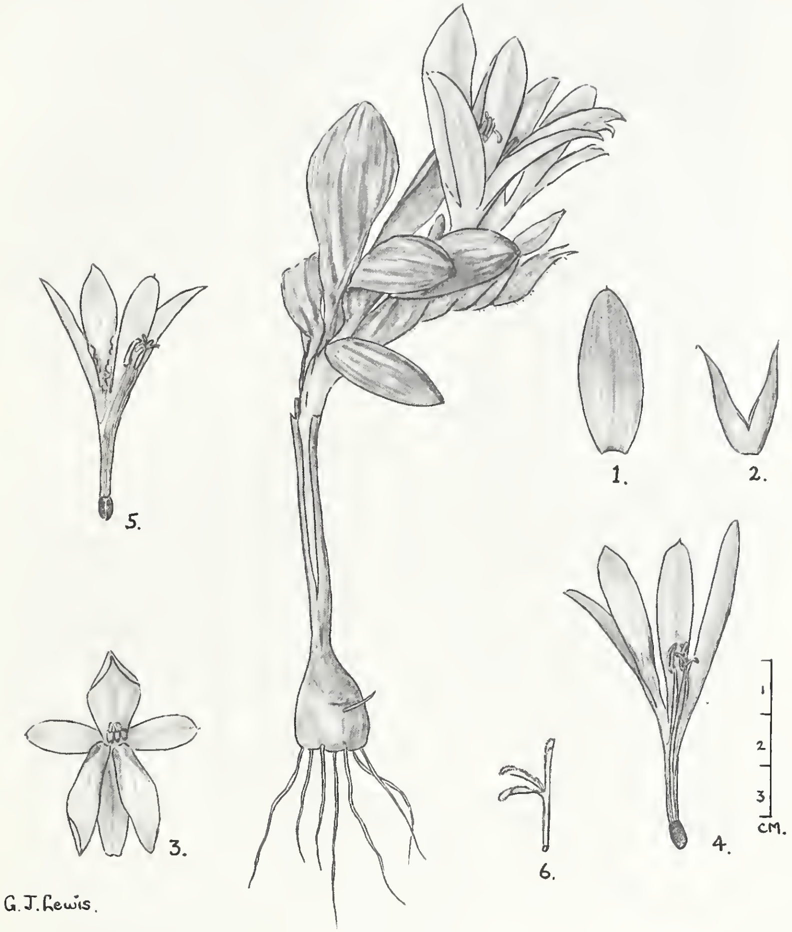

PLATE 13.
B. scabrifolia Brehm. ex Klatt. (Slightly reduced.) Plant from Nardouw Pass, grown in National Botanic Gardens, Kirstenbosch.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower. 5. Section of flower from a different plant. 6. Top of style and style branches × 3.

Baker Handbk. Irid. 183 and Fl. Cap. 6: 112; Dur. & Sch. l.c. 200. *B. subglabra* Lewis, Fl. Pl. S. Afr. 14, p. 545 (1934). *B. adpressa* Lewis, Journ. S.A. Bot. 4: 1 (1938).

Corm ovoid, 1—2 cm. diam.; tunics of slightly matted soft reddish brown fibres, with a neck 4—8 cm. long. *Stem* usually very short, decumbent or suberect and flexuose, pubescent above the base, simple or with 1—3 very short branches. *Leaves* 5—7, distichous, usually spreading fan-wise, sometimes suberect or decumbent, ovate-oblong to lanceolate, obtuse or acute, occasionally acuminate, 3—9 cm. long, 0·6—2 cm. wide, usually minutely and somewhat sparsely pubescent or puberulous, sometimes glabrous, not or scarcely plicate, the juvenile leaves with slender subterete petioles extending 2·5—4 cm. above ground and the blade usually more or less spirally curled or twisted, the mature leaves with flattened conduplicate petioles 0·5—3 cm. long, 2—3 mm. wide, often pilose on the margins. *Spike* distichous or secund, closely 4—8-flowered, if secund then the flowers facing the stem apex. *Bract* ovate to oblong, obtuse, subacute or sometimes acute, mucronate, 2—3·2 cm. long, somewhat ventricose, herbaceous, subglabrous, puberulous or pubescent, often with narrow hyaline ciliate margins; *bracteoles* similar to the bract but narrower, more acute and slightly shorter, with wider hyaline margins, free or shortly united at the base. *Flowers* bilabiate, pale blue or lilac, the lower lateral lobes with a large pale yellow area subtended by a purple W-shaped mark; *perianth tube* straight or slightly curved above the middle, 1·2—1·8 cm. long, the upper half narrowly infundibuliform; *lobes* usually more or less lanceolate, obtuse or subacute, occasionally subunguiculate, the outer mucronate and usually ciliate on the medial vein outside; dorsal lobe free, longer and slightly wider than the others, 3—4·5 cm. long, up to 1 cm. wide; upper lateral lobes shortly united with the 3 lower in a lip, 2·5—4 cm. long, 4—7 mm. wide; 3 lower lobes 2—3·5 cm. long, 4—7 mm. wide, united for 2—3 mm., the margins of the 2 lateral undulate and colourless below the middle. *Stamens* arcuate; filaments 1·3—1·8 cm. long; anthers 6—8 mm. long. *Ovary* oblong or rotund, 3·5—5 mm. long, sparsely pubescent above the base, sometimes only on the ribs; style reaching to middle or top of anthers, with conduplicate oblanceolate or spathulate branches 3—5 mm. long.

Confined to the Clanwilliam Division where it is fairly common on sandy flats, hills and lower mountain slopes.

LECTOTYPE. The type has not been seen and was probably destroyed during the war. *Drege* 2623, an isotype in Kew Herbarium, is selected as the lectotype.

Flowering period. June—August.

CLANWILLIAM. Langevallei: *Drege* 2623. Olifants R. Valley, near

Clanwilliam: *Lewis*, N.B.G. 1812/32 (type of *B. subglabra*, in Herb. Bol.). Thirteen miles N. of Clanwilliam: *Barker* 6423; *Lewis* 2193. Between Bulshoek Barrage and Clanwilliam: *Lewis* 1888. Near Clanwilliam Dam: *Lewis* 1889. Clanwilliam: *Compton* 10992; *Mader* in Herb. MacOwan 2169 (type of *B. occidentalis*, in Kew Herb.); *Esterhuysen* 5372. Between Leipoldtville and Graafwater: *Leipoldt* 3875. Alpha (Kriedowkrans): *Martin*, N.B.G. 1248/37, 1244/37. Nardouw Pass: *Salter*, N.B.G. 1159/33 (type of *B. adpressa*, in Herb. Bol.). Near Clanwilliam: *L. Bolus* and *Lewis* (20286 in Herb. Bol.). Brakfontein: *Schlechter* 7984.

This is a confusing species owing to the very varied forms of the leaves. Juvenile plants, with long slender petioles and spirally curled blades, differ so markedly from some of the older and fully mature plants, especially those with more or less decumbent obtuse leaves, that this led me to describe these as separate species some years ago. It has since been found that the various forms are connected by intermediates, and that the plants I described as *B. adpressa* and *B. subglabra* represent two extremes of the same species, and that the type of the former matches isotypes of *B. scabrifolia* in Kew Herbarium and the Natural History Museum Herbarium, Paris. It is closely allied to *B. ambigua* from which it is distinguished mainly by its more ovate corm, with different corm tunics and a well-developed neck, and the very variable leaves which are quite unlike those of *B. ambigua*. Hybrids between these species have been found and are cited under *B. ambigua*.

Baker considered *B. scabrifolia* to be the same as *B. mucronata* (Jacq.) Ker, his description in the Flora Capensis being drawn partly from a specimen of *B. scabrifolia* and partly from one of *B. stenomera* Schltr., but it differs from Jacquin's figure of that species in the following points: (i) The stem is shorter and the flowers do not overtop the leaves. (ii) The leaves are shorter and not or scarcely plicate. (iii) The flowers are more open or ringent with comparatively longer, narrower and more widely spreading lobes, the two lower lateral with pale and conspicuously undulate margins in the lower half and a dark purple mark at the base of the pale yellow area.

B. occidentalis is a luxuriant shade form of this species, as was suspected by Baker. Near Clanwilliam I have found tall robust plants with a fairly long stem overtopped by long lanceolate leaves which match the type of *B. occidentalis*, growing with the typical short-stemmed and short-leafed plants, the former in the shelter of rocks and bushes and the latter in open sunny places only a few yards away.

B. scabrifolia Brehm. ex Klatt var. **acuminata** Lewis var. nov.

Cormus tunicis in collo dense fibroso 8—15 cm. longo productis.

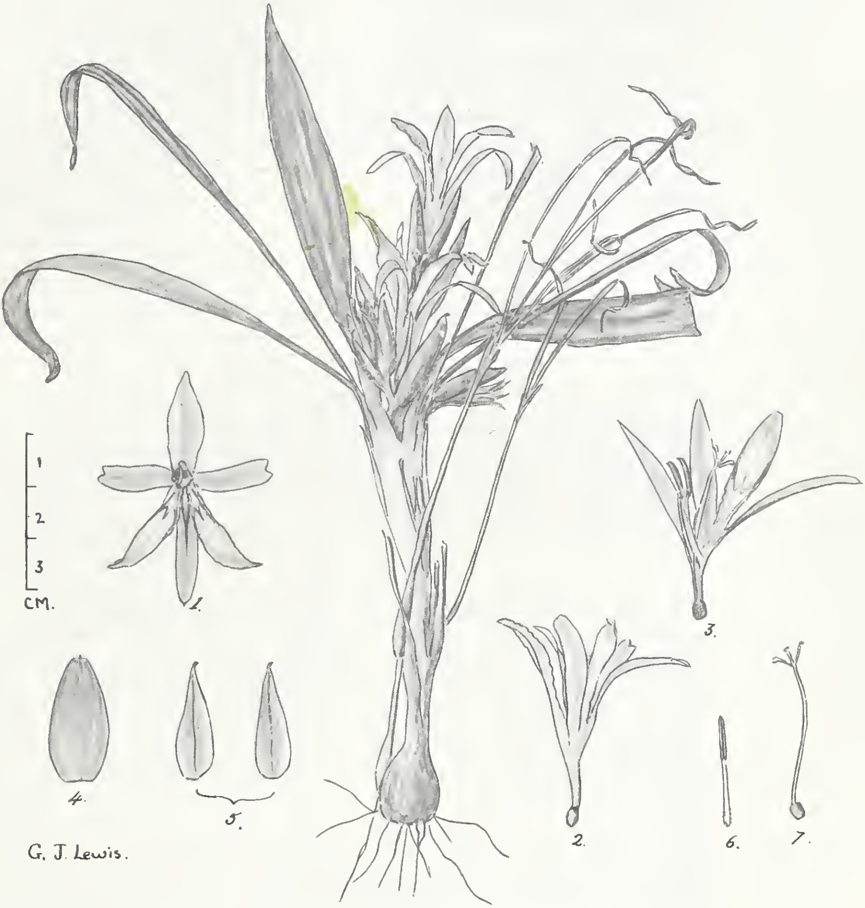

PLATE 14.
B. scabrifolia Brehm. ex Klatt. (Slightly reduced.) Plant from near Clanwilliam, grown in National Botanic Gardens, Kirstenbosch.
1. Flower, front view. 2. Flower, side view. 3. Section of flower. 4. Bract. 5. Bracteoles. 6. Stamen. 7. Gynaecium.

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Caulis 1—2 cm. vel ad 10 cm. longus, erectus vel declinatus, plerumque ramis 1—3. *Folia* erecta vel suberecta, lanceolata, acuminata, puberula, 8—20 cm. longa, flores superantia. *Spica* disticha vel secunda, 5—10-flora. *Bractea* lanceolata vel lineari-lanceolata, acuta vel acuminata, raro subobtusa, 2·5—3·5 cm. longa. *Flores* var. *scabrifoliae* similes sed plerumque leviter minores.

Corm with a thick fibrous neck 8—15 cm. long. *Stem* from 1 or 2 cm. up to 10 cm. long, erect or declinate, usually with 1—3 branches. *Leaves* erect or suberect, lanceolate, acuminate, puberulous, 8—20 cm. long, overtopping the flowers. *Spike* distichous or secund, 5—10-flowered. *Bract* lanceolate or linear-lanceolate, acute or acuminate, rarely subobtuse, 2·5—3·5 cm. long. *Flowers* as in var. *scabrifolia* but usually slightly smaller.

Valleys or mountain slopes in the Clanwilliam Division, usually growing among bushes or rocks.

TYPE. *Lewis* 2192 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. July—August.

CLANWILLIAM. Bulshoek Barrage, Olifants R. Valley: *Lewis* 2192; *Barker* 6428. Pakhuis Pass: *Lewis* 1881. Lower eastern slopes of Pakhuis: *Lewis* 1880. Six miles N. of Citrusdal: *Schelpe* 4733. Ten miles S. of Clanwilliam: *Lewis* 1879. Slopes of Middelberg, Cedarberg: *Esterhuysen.*

The leaves in this variety are more or less uniform, lanceolate and acuminate, and the bracts much narrower than in var. *scabrifolia,* but the other characters are the same.

B. scabrifolia Brehm. ex Klatt var. **declinata** Lewis var. nov.

Caulis brevissimus et decumbens vel ad 8 cm. longus et declinatus, plerumque simplex. *Folia* declinata vel suberecta, lanceolata vel interdum oblongo-lanceolata, plerumque acuta, 3—10 cm. longa, 0·7—1·2 cm. lata, pubescentia vel puberula, interdum plus minusve laxe plicata. *Flores* var. *scabrifoliae* similes sed semper ad apicem caulis aspicientes.

Stem very short and decumbent or up to 8 cm. long and declinate, usually simple. *Leaves* declinate or suberect, lanceolate, occasionally oblong-lanceolate, usually acute, 3—10 cm. long, 0·7—1·2 cm. wide, pubescent or puberulous, sometimes somewhat laxly plicate. *Spike* secund. *Bract* lanceolate or oblong-lanceolate, acute or subacute. *Flowers* always turned to face the stem apex, otherwise as in var. *scabrifolia. Ovary* villous above the base.

Flats, hills and mountain slopes east of the Cedarberg and Pakhuis Mountains in the Clanwilliam Division.

TYPE. *Lewis* 2207 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. July—August.

Clanwilliam. Between Brandewyn and Doorn Rivers, 10 miles W. of Doorn R.: *Lewis* 2207. Doornbosch, 15 miles S. of Doorn R.: *Barker* 6566. Two miles N. of Langekraal, Doornbosch–Clanwilliam road: *Salter* 3507. Welbedacht, Bidouw R. Valley: *Lewis* 5027. Citadel Kop: *Compton* 24240. Brandewyn River: *Lewis* 2206; *Barker* 6587.

The more declinate habit with shorter, less acuminate and slightly plicate leaves, distinguishes this from the var. *acuminata*.

22. **B. klaverensis** Lewis sp. nov.

Cormus ovoideus, 1·8—2·5 cm. diam., tunicis concretis e fibris tenuibus vel sat robustis in collo 8—12 cm. longo productis, compositis. *Caulis* erectus vel decumbens, gracilis, simplex, 2·5—4 cm. longus, basin versus glaber, superne velutinus. *Folia* 5, disticha, suberecta, lanceolata, acuminata, firma marginibus leviter incrassatis, paulo pungentia, 6·5—9·5 cm. longa, 3·5—7 mm. lata, non vel vix plicata, dense minute pubescentia. *Spica* disticha vel secunda, dense 3—6-flora. *Bractea* lanceolata, acuminata, carinata, mucronata, herbacea, pubescens, 1·1—1·5 cm. longa; *bracteolae* liberae, lanceolatae, acuminatae, bracteae similes sed leviter breviores marginibus hyalinis ciliatis. *Flores* parvi, bilabiati, caerulei vel lilacini; *perianthii tubus* circa 1 cm. longus, anguste infundibuliformis; *segmenta* marginibus hyalinis, lanceolata, obtusa vel retusa, 4—6 mm. lata, exteriora mucronulata et nervo medio extrinsecus ciliato; segmentum dorsale liberum, 2·5 cm. longum; segmenta lateralia superiora cum 3 inferioribus in labio breviter coalita, omnia 2—2·3 cm. longa. *Stamina* arcuata filamentis circa 1·3 cm. longis antherisque 6 mm. longis. *Ovarium* rotundum, pubescens; stylus prope ad apicem antherarum attingens, ramis spathulatis 3 mm. longis.

Corm ovoid, 1·8—2·5 cm. diam.; tunics of matted fine to fairly coarse reddish brown fibres, with a neck 8—12 cm. long. *Stem* erect or decumbent, very slender, simple, 2·5—4 cm. long, glabrous near the base, velutinous above. *Leaves* 5, distichous, suberect, lanceolate, acuminate, firm with slightly raised fairly prominent margins, somewhat pungent, 6·5—9·5 cm. long, 3·5—7 mm. wide, not or scarcely plicate, densely minutely pubescent. *Spike* distichous or secund, closely 3—6-flowered. *Bract* lanceolate, carinate, mucronate, herbaceous, pubescent, 1·1—1·5 cm. long; *bracteoles* free, lanceolate, acuminate, similar to the bract but slightly shorter and with narrow hyaline ciliate margins. *Flowers* small, bilabiate, blue or mauve; *perianth tube* about 1 cm. long, narrowly infundibuliform; *lobes* with hyaline margins, lanceolate, obtuse or retuse, 4—6 mm. wide, the outer mucronulate and ciliate on the medial vein outside; dorsal lobe free, 2·5 cm. long; upper lateral lobes shortly united

with the 3 lower in a lip, all 2—2·3 cm. long. *Stamens* arcuate; filaments about 1·3 cm. long; anthers 6 mm. long. *Ovary* rotund, pubescent; style reaching nearly to top of anthers, with spathulate branches 3 mm. long.

Very local in sandy soil on mountain slopes above Klaver, at about 250 m. altitude.

TYPE. *Andreae* 505 in the Marloth Herb., National Herbarium, Pretoria.

Flowering period. June—July.

VANRHYNSDORP. Klaver: *Andreae* 505; *L. Bolus* and *Lewis*, N.B.G. 1847/32; *Salter* 982.

The firmer leaves with slightly raised margins and smaller bracts and flowers distinguish this species from *B. scabrifolia*, to which it is probably most closely allied. It has been described from a few herbarium specimens from the vicinity of Klaver, and not very much is known of the species.

23. **B. salteri** Lewis sp. nov. (Plate 15).

Cormus ovoideus basi paulum planus, 1·8—2·5 cm. diam., tunicis e fibris rubido-brunneis sat robustis parallelis, in collo 5—7 cm. longo productis, compositis. *Caulis* erectus, pubescens, 4—10 cm. altus, ad medium vel ultra foliis opertus, ramis 1—3 brevissimis. *Folia* 6—7, disticha, petiolis supra terram per 0·5—5 cm. productis et laminis patentibus apicem versus suberectis, oblique oblongis vel ovato-oblongis, acutis, minute pubescentibus, basin versus plicatis superne planis, 2—5 cm. longis, 1—2·4 cm. latis. *Spica* disticha dense 6—10-flora rachide flexuoso. *Bractea* oblongo-lanceolata, mucronata, herbacea, striata, villosa, 1—1·3 cm. longa; *bracteolae* quam bractea leviter breviores, liberae, lanceolatae, acuminatae, herbaceae, villosae marginibus hyalinis. *Flores* parvi, bilabiati, lilacini segmentis inferioribus lateralibus luteis; *perianthii tubus* 9 mm. longus, anguste infundibuliformis; *segmenta* oblanceolata, subunguiculata, obtusa vel subacuta, exteriora mucronata et recurva, dorsale liberum, arcuatum, 2·3 cm. longum, 6 mm. latum, 2 lateralia superiora 1·5 cm. longa, 3—4 mm. lata, cum 3 inferioribus in labio breviter coalita; 3 inferiora basi per 1—2 mm. coalita, 1·3—1·5 cm. longa, 3—4 mm. lata. *Stamina* arcuata filamentis 1·2—1·4 cm. longis antherisque 7 mm. longis. *Ovarium* oblongum, 3 mm. longum, dense villosum vel sericeum; stylus ad medium antherarum attingens ramis oblanceolatis vel spathulatis conduplicatis 2·5—3 mm. longis.

Corm ovoid, somewhat flat at the base, 1·8—2·5 cm. diam.; tunics of reddish brown fairly coarse parallel fibres, with a neck 5—7 cm. long. *Stem* erect, pubescent, 4—10 cm. high, the lower half or more concealed by the leaf petioles, with 1—3 very short branches. *Leaves* 6—7, distichous, the petioles extending 0·5—5 cm. above ground, the blades almost at right angles and spreading more or less horizontally, obliquely oblong or ovate-oblong with short acute upturned tips, plicate at the base only, minutely pubescent, 2—5 cm. long, 1—2·4 cm. wide. *Spike* distichous, the rachis flexuose, densely 6—10-flowered. *Bract* oblong-lanceolate, mucronate, herbaceous, striate, villous, 1—1·3 cm. long; *bracteoles* free, lanceolate, acuminate, green and villous with hyaline margins, almost as long as the bract. *Flowers* small, bilabiate, mauve, the lower lateral lobes yellow; *perianth tube* narrowly infundibuliform, 9 mm. long; *lobes* oblanceolate, subunguiculate, obtuse or subacute, the outer mucronate and recurved, the dorsal free, arcuate, 2·3 cm. long, 6 mm. wide, the upper lateral 1·5 cm. long, 3—4 mm. wide, shortly united with the 3 lower in a lip; 3 lower lobes 1·3—1·5 cm. long, 3—4 mm. wide, united for 1—2 mm. at the base. *Stamens* arcuate; filaments 1·2—1·4 cm. long; anthers 7 mm. long. *Ovary* oblong, 3 mm. long, densely villous or sericeous; style reaching about half-way up anthers, with oblanceolate or spathulate conduplicate branches 2·5—3 mm. long.

Local on stony hills in the Vanrhynsdorp Division.

TYPE. *Salter* 7318 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. June—July.

VANRHYNSDORP. Sixteen miles N.E. of Vanhrynsdorp on road to Calvinia: *Salter* 7318.

A very distinct species, the small flowers with very irregular lobes being similar to those in the section Exohebeoides except that the lobes taper to the base and are not distinctly unguiculate. Other characters which keep it out of that section are the free bracteoles and more or less sericeous ovary.

24. **B. minuta** Lewis sp. nov. (Plate 16).

Planta caespitulosa. *Cormus* 1 cm. diam., tunicis e fibris tenuibus submembranaceis pallide rubido-brunneis in collo 7—13 cm. longo productis, compositis. *Caulis* simplex, brevissimus et decumbens vel interdum omnino subterraneus. *Folia* 5—6, recta vel leviter falcata, plus minusve ad terram adpressa, lanceolata, acuta vel acuminata, 2—5 cm. longa, 2—4 mm. lata, solum basin versus plicata, villosa vel sat dense pilosa. *Spica* brevissima, compacte 1—3-flora. *Bractea* lanceolata, acuta vel acuminata, 2—3·2 cm. longa, infra medium plus minusve membranacea, superne herbacea, pubescens, marginibus angustis hyalinis, apice plerumque sphacelata; *bracteolae* bracteae similes et leviter breviores vel longiores, coalitae apicibus liberis acuminatis vel setaceis. *Flores* bilabiati, odorati, segmentis violaceis marginibus luteis, inferioribus

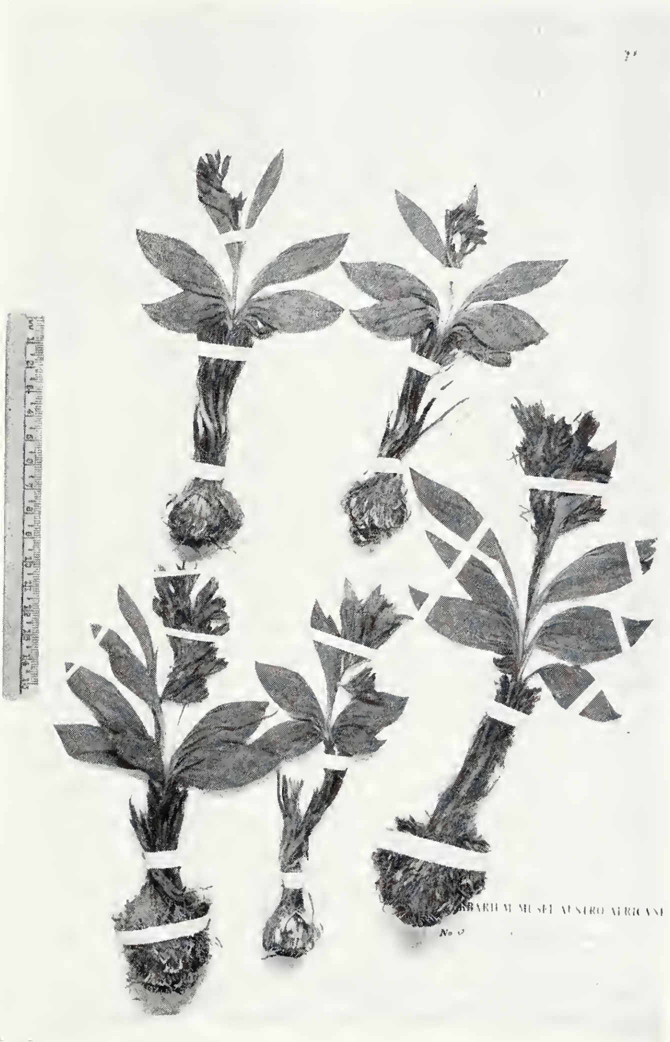

PLATE 15.
B. salteri Lewis. Type sheet, in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

lateralibus pro parte majore luteis sed basin versus macula sagittata purpurea notatis; *perianthii tubus* 2—2·2 cm. longus, filiformis tertia parte superiore ad fauces ampliata et subinfundibuliformi; *segmenta* lanceolata vel plus minusve oblanceolata, obtusa, exteriora mucronata, dorsale liberum, arcuatum, 3—3·3 cm. longum, 6—8 mm. latum, 2 lateralia superiora cum 3 inferioribus in labio breviter coalita; 3 inferiora 2—2·5 cm. longa, 5—7 mm. lata, basi per 1 mm. coalita, 2 lateralia inferiora marginibus basin versus undulatis. *Stamina* arcuata filamentis 1·5—1·7 cm. longis antherisque 5—6 mm. longis. *Ovarium* oblongo-rotundum, 4 mm. longum, glabrum; stylus ad apicem antherarum attingens ramis oblanceolatis conduplicatis 3 mm. longis.

Plants caespitulose, the mature plant surrounded by 2 or more young plants. *Corm* about 1 cm. diam.; tunics of pale reddish brown, soft and somewhat membranous fibres, with a neck 7—13 cm. long. *Stem* simple, extremely short and decumbent, sometimes not extending above ground and the flowers arising just below the ground surface. *Leaves* 5—6, straight or slightly falcate, more or less decumbent, lanceolate, acute or acuminate, plicate at the base only, villous or fairly densely pilose, 2—5 cm. long, 2—4 mm. wide. *Spike* very short, compact, 1—3-flowered. *Bract* lanceolate, acute or acuminate, 2—3·2 cm. long, the lower half glabrous and somewhat membranous, herbaceous and pubescent above with narrow hyaline margins, the apex usually sphacelate; *bracteoles* similar to the bract and slightly shorter or longer, almost entirely united with free acuminate or setaceous tips. *Flowers* bilabiate, fragrant, the lobes dark mauve or violet coloured, yellow round the margins, the lower lateral mostly yellow with a purple sagittate mark shortly above the base; *perianth tube* straight or almost so, 2—2·2 cm. long, filiform below, the upper third expanded to the throat and subinfundibuliform; *lobes* lanceolate or more or less oblanceolate, obtuse, the outer mucronate, the dorsal free, arcuate, 3—3·3 cm. long, 6—8 mm. wide, the upper lateral shortly united with the 3 lower in a lip; 3 lower lobes 2—2·5 cm. long, 5—7 mm. wide, united for 1—2 mm., the lateral with the margins undulate in the lower half. *Stamens* arcuate; filaments 1·5—1·7 cm. long; anthers 5—6 mm. long. *Ovary* oblong-rotund, 4 mm. long, glabrous; style reaching to top of anthers, with oblanceolate conduplicate branches 3 mm. long.

The plants grow in tufts wedged between stones and shales in the Vanrhynsdorp, Calvinia and Ceres Divisions.

TYPE. *Salter* 2508 in the Bolus Herbarium.

Flowering period. June—August.

VANRHYNSDORP. Four miles N. of Vanrhynsdorp: *Salter* 5609. Vanrhynsdorp: *Salter* 2508. Wiedou Rivier: *Lewis* 2322.

CALVINIA. Five miles S.W. of Calvinia: *Lewis* 1883. Two miles S. of Oorlogs River bridge: *Salter* 3496. Windkraal, Hantam River Valley: *Marloth* 10219.

CERES. Karroo Poort: *Hall* 533; *Esterhuysen* 5481.

WITHOUT LOCALITY. *Giffen,* N.B.G. 910/24.

Babiana minuta is the smallest species in the genus. In *Hall* 533 from Karroo Poort the bracteoles are united to the middle and the ovary is sparsely hairy above the base.

25. **B. namaquansis** Baker Handbk. Irid. 181 (1892) and Fl. Cap. 6: 109 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895). *B. buchubergensis* Dinter in Fedde Rep. 29: 254 (1931).

Corm ovoid or globose, 1—1·5 cm. diam.; tunics of fine reticulate pale brown or reddish brown fibres, with a thin neck 8—10 cm. long. *Stem* simple, glabrous, angled, extending less than 1 cm. above ground. *Leaves* 5, linear or linear-lanceolate, about 3—7 cm. long, 1·5—3·5 mm. wide, spirally curled and twisted, villous, not or slightly plicate, the median nerve and margins fairly prominent. *Spike* closely 1—3-flowered. *Bract* oblong-lanceolate, acute, 1·7—2·7 cm. long, glabrous, herbaceous, with narrow scariose margins, the apex more or less membranous; *bracteoles* as long as the bract, united, with fairly wide hyaline margins and free hyaline tips. *Flowers* zygomorphic, dark mauve or purple; *perianth tube* 1·8—2·5 cm. long, infundibuliform above the middle; *lobes* arising obliquely, more or less lanceolate or obovate-oblong, 2·5—4 cm. long, 0·6—1·1 cm. wide, acute or obtuse, the outer mucronulate; dorsal lobe about 5 mm. longer than the 3 lower. *Stamens* subarcuate; filaments about 1·2 cm. long; anthers 5—6 mm. long. *Ovary* not seen; style reaching to top of anthers or slightly above, with linear-oblanceolate conduplicate branches 4 mm. long.

Stony ground on coastal flats or desert from Port Nolloth northwards to South West Africa.

TYPE. *Bolus* 6579 in Kew Herbarium.

Flowering period. August.

NAMAQUALAND. Near Port Nolloth: *Bolus* 6579; *Marloth* (12664 in Nat. Herb., Pretoria). Port Nolloth to O'okiep: *Pfeil* 40. Steinkopf: *Marloth* (13348 in Nat. Herb., Pretoria) (without flowers and leaves wider than in type).

SOUTH WEST AFRICA. Buchuberg, coastal desert, on micaceous schists in a water ravine: *Dinter* 6569 (type of *B. buchubergensis,* in Berlin-Dahlem Herb.).

There can be little doubt that *B. buchubergensis* Dinter is the same as *B. namaquensis,* and that the type of *B. namaquensis* consists of juvenile

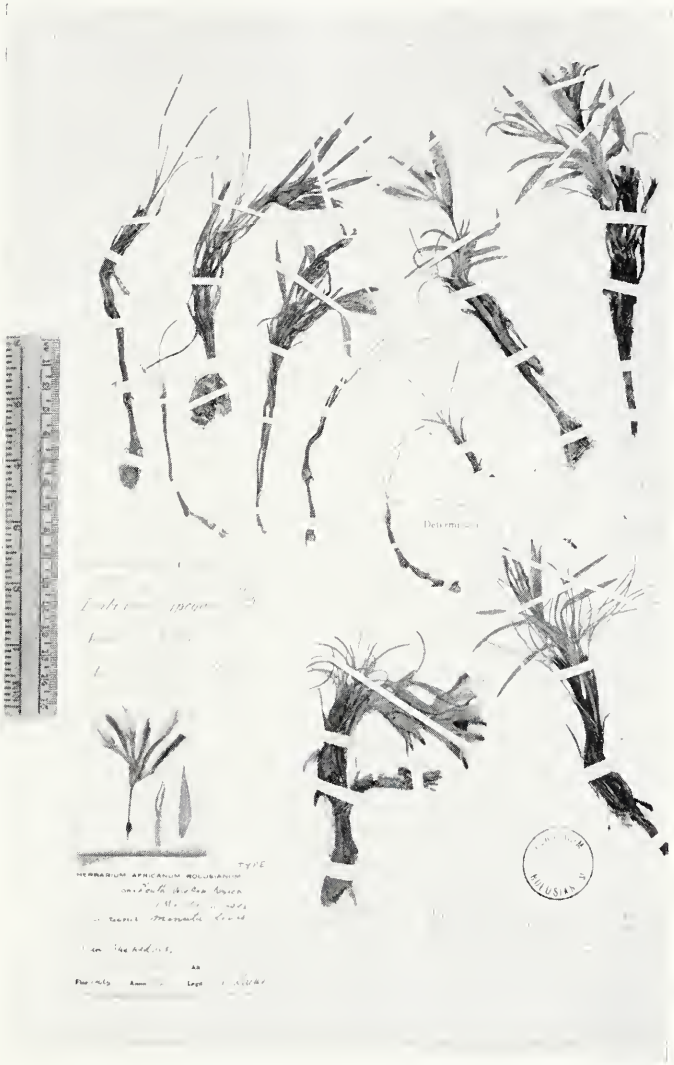

PLATE 16.
B. minuta Lewis. Type, mounted with *Giffen* NBG 910/24, in the Bolus Herbarium.

plants. In Dinter's specimens the corm is larger, about 1·8—2·2 cm. diam., and with one of the mature specimens there is a juvenile plant, developed from an axillary cormlet. The young plant has spirally curled leaves exactly like those of the type of *B. namaquensis*, but in the old plants they are wider, lanceolate or linear-lanceolate, 3—6 cm. long, 3—3·5 mm. wide, and recurved at or above the middle, with a slight to distinct spiral twist, though according to Dinter's description the leaves are not spirally twisted. The upper half of the leaf is pubescent with short hairs and the lower half with short hairs mixed with long silky hairs.

26. **B. nana** (Andr.) Spreng. (Plate 17), Syst. 1: 156 (1825); Ker Gen. Irid. 154 (1827); Klatt Erganz. 15 (1882), pro parte; Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895), pro parte. *Gladiolus nanus* Andr. Bot. Rep. t. 137 (1801); Pers. Syn. 1: 44 (1805); Roem. & Schult. Syst. 1: 439 (1817). *Babiana Sprengelii* Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 182 (1892) and Fl. Cap. 6: 110 (1896). *B. pygmaea* Spreng. MS, in Herb. Zeyher; Spreng. ex Steud. Nom. ed. 2, 1: 176 (1840), *nomen nudum*. *B. pygmaea* Baker, Journ. Linn. Soc. 16: 165, Handbk. Irid. 181 and Fl. Cap. 6: 109, pro parte; non N.E. Br. (1929). *Ixia corymbosa* Burm. f. Prodr. 1 (1768), pro parte; non L. (1762). *Babiana fragrans* Eckl. Top. Verz. 31 (1827), pro parte. ? *B. plicata* Baker (non Ker) var. *Forsteri* Baker Handbk. Irid. 184 and Fl. Cap. 6: 112.

Corm small, globose or subglobose, 1—1·5 cm. diam.; tunics of fine brown reticulate fibres, without a neck. *Stem* short, the subterranean part 6—11 cm. long, often with 1—2 cormlets in the leaf axils, the aerial part 3—10 cm. long, erect, sometimes flexuose, villous, simple or with 1—3 short erect branches. *Leaves* 5—7, distichous, spreading fan-wise or occasionally suberect, usually with a slender or somewhat flattened petiole extending 1—6 cm. above ground, the blade arising very obliquely, obovate, obovate-oblong or oblanceolate-oblong, nearly always abruptly contracted to a short acute tip, not or scarcely plicate, villous, pubescent or velutinous, 2—12 cm. long, 0·9—3 cm. wide, usually 3·5—6 cm. long and 1—2 cm. wide. *Spike* short, distichous, fairly closely 2—6-flowered, the flowers usually overtopping the leaves. *Bract* ovate or oblong, more or less ventricose, 1·6—3 cm. long, herbaceous, villous, the apex sometimes sphacelate; *bracteoles* as long as and similar to the bract, united to above the middle, sometimes nearly to the apex, firmly bicarinate, acute or acuminate. *Flowers* zygomorphic, widely campanulate, very fragrant, blue, mauve-blue, mauve or rose-pink, the lower lateral lobes with a small pale yellow or whitish area near the middle and usually with a purple or reddish purple sagittate mark near the base; *perianth tube* straight, 1·2—1·7 cm. long, the upper half infundibuliform, sometimes minutely puberulous near the throat inside; *lobes* arising slightly obliquely, the 3 upper usually 2—4 mm. longer than the 3 lower, equal or almost equal in width, 2·3—4 cm. long, 0·6—1·4 cm. wide, obovate-oblong, oblong or elliptic-oblong, rarely subunguiculate, obtuse or retuse, the margins often somewhat undulate; outer lobes with a very small dark conical mucro and occasionally with a few hairs near the apex outside. *Stamens* arcuate; filaments 1·2—1·5 cm. long, sometimes with a few minute hyaline hairs at the base; anthers 5—6 mm. long. *Ovary* ovoid or subglobose, 3—5 mm. long, glabrous or occasionally puberulous on the ribs; style reaching to middle or top of anthers, with oblanceolate conduplicate, minutely gland-ciliate branches 6—8 mm. long.

Coastal flats and sand dunes in the coastal districts from Piketberg to the Cape.

TYPE. Andrew's Bot. Rep. t. 137.

Flowering period. August—September.

PIKETBERG. Salt pans near Soutkloof: *Steyn* 567.

HOPEFIELD. Saldanha Bay: *Zeyher* (type of *B. Sprengelii*, in Berlin-Dahlem Herb.); *Ecklon* and *Zeyher* 122, 123. Near Hopefield: *Lewis* 1055; *Leighton* 625; *Compton* 15949. Geelbek: *Barker* 4618. Koperfontein: *Barker* 8157.

MALMESBURY. Near Moorreesburg: *L. Bolus* and *Lewis*, N.B.G. 1810/32. Seven miles E. of Ysterfontein: *Salter* 6231. Ysterfontein: *Compton* 7481. Between Ysterfontein and Darling: *L. Bolus*. Between Darling and Malmesbury: *Leipoldt; Lavis*. Darling: *Rogers* 11101 b. At turn to Ganskraal: *Barker* 727. Mamre hills: *Wasserfall* 445. Two to three miles S. of Mamre: *Lewis* 2225, 3568.

BELLVILLE. Ten miles S. of Mamre: *Davis* (59862 in S. Af. Mus.). Corner of Melkbosstrand and Mamre roads: *Lewis* 84. Groot Springfontein: *Wasserfall* 234.

CAPE. Rietvlei: *Zeyher* 62. Blouberg: *Davis* (59861 in S. Af. Mus.); *Thorne* (52920 in S. Af. Mus.); *Leighton* 7. Milnerton: *Bond* 429.

WITHOUT LOCALITY. *Burmann; Ventenat; Drege* 8382.

Like most of the common species in the genus, *B. nana* has a somewhat involved history. It was figured by Andrew in 1801 as *Gladiolus nanus*, then transferred by Sprengel to Babiana in 1825, and after that was recognized as *Babiana nana* (Andr.) Spreng. by Ker, Klatt and Durand and Schinz, but not by Baker. Sprengel first gave a MS. name, *B. pygmaea*, to a Zeyher specimen in the Herb. Zeyher (Berlin-Dahlem Herbarium) but later he evidently realized that it matched Andrew's figure so named it *B. nana*. He never described the species as *B. pygmaea*, and though this name was listed by Steudel in 1840 (Nomen. ed. 2), it is a *nomen nudum.*

Baker confused the species with *Ixia pigmaea* Burm. f. and in 1877 he named it *Babiana pygmaea,* giving as synonyms *Ixia pigmaea* Burm., *Babiana nana* Spreng. and *Gladiolus nanus* Andr. To add to the confusion the description he gave in the Handbook of Iridaceae and Flora Capensis was drawn from two specimens, *Zeyher*—without locality, and *Drege* 2625 from the Clanwilliam Division. These specimens are mounted together on one sheet in Kew Herbarium, but represent two different species, the first being *Babiana ambigua* (R. & S.) Lewis and the second a very distinct variety of *B. nana,* possibly a separate species (see note under *B. nana* var. *confusa* Lewis). Baker did not cite Burmann's specimen and it is obvious that he never saw it for had he done so he could not have made this mistake as the type of *Ixia pigmaea* has large yellow actinomorphic flowers and in no way resembles Andrew's figure of *Gladiolus nanus,* nor the two specimens described by Baker; it is the species named *Babiana macrantha* by MacOwan and now known as *B. pygmaea* (Burm. f.) N. E. Br.

Baker then proceeded to describe Zeyher's specimen of *B. nana* in the Berlin-Dahlem Herbarium, to which Sprengel had given the MS. name *B. pygmaea,* as new, naming it *B. Sprengelii,* but added that it was "perhaps only a variety of *B. pygmaea* (i.e. *B. pygmaea* Baker), with which Dr. Klatt unites it". Klatt and Durand and Schinz placed *B. pygmaea* Baker as a synonym of *B. nana,* and the latter, following Baker, added *Ixia pigmaea* Burm. f.

In Burmann's collection there are some specimens of *Babiana nana* named *Ixia corymbosa* by Burmann, as he confused these, as well as one or two other species, with *I. corymbosa* L. (=*Lapeirousia corymbosa* (L.) Ker).

I have not seen the type of Baker's var. *Forsteri* of *Babiana plicata* but from the description, "lower leaves with a broad half-deltoid lamina developed only on the outer side of the midrib", it is almost certainly the same as specimens from Blouberg in the South African Museum Herbarium (*Thorne* 52920), which are either a form of *B. nana* var. *nana,* or possibly hybrids between this and the var. *angustifolia.* Hybrids with *B. pulchra* have been found between Darling and Ysterfontein, with both parents growing in the vicinity (*Lewis* 2226). In general appearance they closely resemble *B. nana,* but the flowers are a very deep purple-blue, with red marks at the base of the 3 lower lobes, and the perianth tube has a slight twist, the flowers being half inverted. Hybrids with *B. ambigua* have also been recorded and are cited under that species.

B. nana (Andr.) Spreng. var. **angustifolia** (Eckl.) Lewis stat. nov. *B. angustifolia* Eckl. Top. Verz. 31 (1827); non Sweet (1827). *B. maculata* Klatt, Abh. Naturf. Ges. Halle 12: 349 (1882); Erganz. 15 (1882); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895). *B. plicata* Baker (non Ker) var. *maculata* (Klatt) Baker. Fl. Cap. 6: 112 (1896). *B. fragrans* Eckl. l.c. 31, pro parte. *B. Schlechteri* Baker, Bull. Herb. Boiss. Ser. 2, 1: 865 (1901). *B. angusta* N. E. Br., Gard. Chron. No. 2400, 92: 467 (1932). *B. plicata* Lewis in Adamson & Salter Fl. Cap. Pen. 244 (1950), pro parte; non Ker (1802).

Leaves linear, lanceolate or oblanceolate, acute or acuminate, usually ascending or suberect, nearly always overtopping the flowers. *Flowers* as in var. *nana* but slightly smaller, the lower lateral lobes sometimes without a dark sagittate mark near the base.

Sandy soil on flats, coastal dunes and hills in the south-western and southern coastal districts of the Cape Province from Paarl and Bellville Divisions to Mossel Bay.

Type. *Ecklon* and *Zeyher* 124 in Herb. Lubeck, Berlin-Dahlem Herbarium.

Flowering period. August—September.

Paarl. Between Paarl Mountains and Paardeberg: *Drege*.

Bellville. Near Melkbosstrand: *Salter* 3567.

Cape. Between Salt River and Kalabas Kraal, 13 miles N. of Cape Town: *Hutchinson* 173. Flats between Salt River and Devils Peak: *Drege* 8387. Devils Peak: *Wilms* 3682 b, partly. Camp Gound: *Schlechter* 1541. Flats near Rondebosch: *Dod* 508. Raapenberg: *Guthrie* 70. Claremont: *Bolus* 4750. Cape Flats: *Rehmann* 1847. Near Wynberg: *MacOwan*, H.N.A.Af. 273. Dunes at Muizenberg: *Schlechter* 1277 (type of *B. Schlechteri* Bkr., in Zürich Un. Herb.). Farmer Peck's Valley, Muizenberg: *Dod* 1381. Buffels Bay: *Leighton* 27; *Compton* 14672. Witsands: *Pillans*. Beyond Camps Bay: *Dod* 1346. Kommetjie: *Barker* 801. Clovelly: *Walgate* 272. Hout Bay: *Martin*, N.B.G. 982/38. Top of Redhill: *Lewis* 48.

Stellenbosch. Doornhoogde, Cape Flats: *Ecklon* and *Zeyher* 124 (type of *B. angustifolia* Eckl. and *B. maculata* Klatt, in Berlin-Dahlem Herb.); *Ecklon* 78.8. Kuils River: *Strey* 580. Near Stellenbosch: *Letty* 289.

Caledon. Near Gansbaai: *Leighton* 1865; *Compton* 18166. Frikkiesbaai: *Leighton* 1916; *Compton* 18186. Genadendal: *Pappe* (21142 in S. Af. Mus., partly).

Bredasdorp. *Compton* 9183. The Poort: *Barker* 2478.

Riversdale. Albertinia Commonage: *Muir* 645. Near Riversdale: *Muir* 4851 (type of *B. angusta* N. E. Br., in Kew Herb.).

Mossel Bay. Little Brak River: *Rogers* 4149.

Without Locality. *Zeyher* 4000; *Bowie* 411.

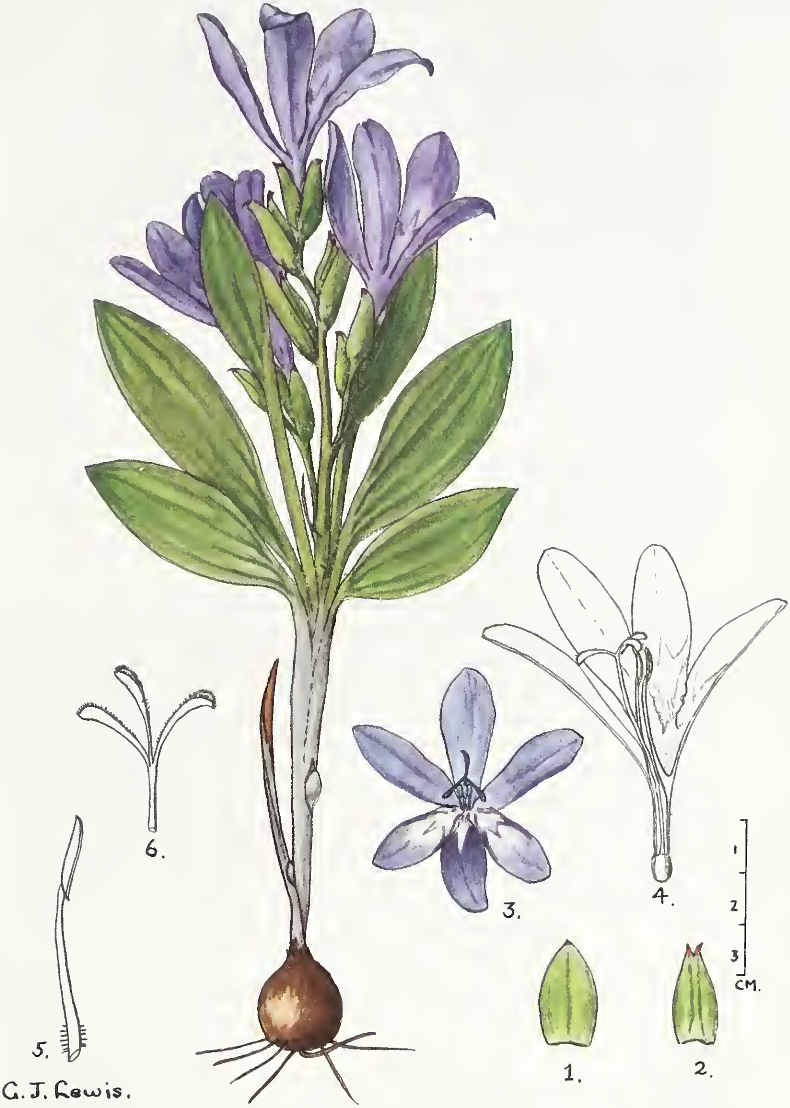

Plate 17.
B. nana (Andr.) Spreng. (Slightly reduced.) Plant from near Mamre.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower × 1½. 5. Stamen × 2. 6. Top of style and style branches × 2.

This variety is distinguished from the var. *nana* only by the narrower leaves and slightly smaller flowers. It has often been confused with *B. ambigua* and incorrectly identified as *B. plicata* in many herbaria. Although it bears a close resemblance to *B. ambigua* it differs in the following characters: (i) The bractcoles are entirely green, without hyaline margins, and always united, usually to above the middle, whereas in *B. ambigua* they have hyaline margins and are free or occasionally shortly united. (ii) The flowers have more uniform lobes, arising slightly obliquely from the perianth tube, the dorsal not more than 2—4 mm. longer than the 3 lower; in *B. ambigua* they are distinctly bilabiate with more irregular lobes, the dorsal 5—10 mm. longer than the 3 lower. (iii) The mucro on the outer lobes is smaller and blunter, somewhat conical in shape with a rounded tip. From *B. plicata* Ker it is well distinguished not only by its habit and leaves but also the united bracteoles and flowers with the perianth lobes at least twice as long as the tube.

B. fragrans Eckl. appears to be a mixture of the two varieties as some of the specimens I have seen so named by him belong to the var. *nana* and others to var. *angustifolia*. Hybrids between *B. ambigua* and *B. nana* var. *angustifolia* have been recorded under the former species.

B. nana (Andr.) Spreng. var. **confusa** Lewis var. nov. *B. pygmaea* Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 181 (1892) and Fl. Cap. 6: 109 (1896), pro parte, excl. syn.; non N. E. Br. (1929).

Cormus var. *nanae* similis, 1 cm. diam. *Folia* 6, suberecta, petiolis planis conduplicatis, supra terram per 0·5—2·5 cm. productis; lamina 5—7 cm. longa, 0·8—1·1 cm. lata, basin et apicem versus angustata, acuta, pubescentia, haud plicata. *Bractea* lanceolata, subobtusa, 2·8—3·8 cm. longa, omnino herbacea, pubescens; *bracteolae* quam bractea aequilongae vel leviter longiores, coalitae apicibus brunneis mucronatis. *Flores* irregulares, pallide lilacini; *perianthii tubus* curvatus, 2·5—3 cm. longus, inferne tenuis, cylindricus, dimidia parte superiore late infundibuliformi ad fauces circa 1 cm. diam.; *segmenta* subaequalia, 3—4 cm. longa, 0·8—1·1 cm. lata. *Stamina* subarcuata, filamentis circa 1·5 cm. longis antherisque 8—9 mm. longis. *Ovarium* oblongum, 5—6 mm. longum, glabrum; stylus antheras leviter superans, ramis spathulatis conduplicatis 5—6 mm. longis.

Corm as in var. *nana*, 1 cm. diam. *Leaves* 6, suberect, with flattened conduplicate petioles extending 0·5—2·5 cm. above ground, the blades 5—7 cm. long, 0·8—1·1 cm. wide, tapering to both ends, acute, pubescent, not plicate. *Bract* lanceolate, subobtuse, 2·8—3·8 cm. long, entirely green, pubescent; *bracteoles* as long as the bract or slightly longer, united with free brown mucronate tips. *Flowers* zygomorphic, pale mauve-blue, somewhat fugitive; *perianth tube* curved, 2·5—3 cm. long, the lower half slender, cylindrical, the upper half broadly infundibuliform, about 1 cm. diam. at the throat; *lobes* subequal, arising slightly obliquely, lanceolate, acute, the outer mucronate, 3—4 cm. long, 0·8—1·1 cm. wide. *Stamens* subarcuate; filaments about 1·5 cm. long; anthers 8—9 mm. long. *Ovary* oblong, 5—6 mm. long, glabrous; style reaching shortly above anthers, with spathulate conduplicate branches 5—6 mm. long.

Flats near the coast from the Berg River to north of Lamberts Bay.

TYPE. *Lewis* 4798 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. July.

PIKETBERG. Near Berg River Station: *Lewis* 4798.

CLANWILLIAM. Between Heerenlogement and Knakarbergen: *Drege* 2625.

Little is known of this variety which has been described from a single herbarium specimen which exactly matches two specimens of *Drege* 2625 in Kew Herbarium, and should more material ever become available it might prove to be a separate species. It differs very markedly from the varieties *nana* and *angustifolia* in having the perianth tube much longer, curved and considerably wider at the throat, longer anthers, the mucro on the outer lobes longer and acuminate and, as far as can be seen from dried material, the lobes overlap at the base to form a broad funnel. *Drege* 2625 was cited under *B. pygmaea* Baker and the confusion about this has already been discussed (see p. 79).

27. **B. cedarbergensis** Lewis sp. nov.

Cormus ovoideus, 1·5—2 cm. diam., tunicis e fibris sat tenuibus reticulatis pallide brunneis, in collo 5—6 cm. longo productis, compositis. *Caulis* brevissimus, decumbens. *Folia* 4—5, erecta, lanceolata, velutina, 4—6 cm. longa, 3—6 mm. lata, rigida, profunde plicata, paulo pungentia. *Spica* secunda, dense 2—5-flora. *Bractea* oblongo-lanceolata, acuta, 2—2·5 cm. longa, herbacea, velutina vel villosa, interdum mucro brunneo minute induta; *bracteolae* quam bractea leviter breviores, ultra medium coalitae, acuminatae, marginibus membranaceis. *Flores* bilabiati, pallide lilacini, segmentis inferioribus lateralibus infra medium luteis basin versus purpureo notatis; *perianthii tubus* 1·6—1·8 cm. longus, ad fauces curvatus, tertia vel quarta parte superiore infundibuliformi; *segmenta* obtusa vel subacuta, 3 exteriora lanceolata, 5—7 mm. lata, mucronata et nervo medio extrinsecus ciliato, 2 superiora lateralia 2·4—3·2 cm. longa cum 3 inferioribus in labio breviter coalita; segmenta 3 interiora elliptico-oblonga, 0·8—1 cm. lata, dorsale liberum 2·8—3·5 cm. longum; segmenta 3 inferiora 2·1—2·7 cm. longa basi 1—2 mm. coalita, 2 lateralia marginibus basin versus undulatis. *Stamina* subarcuata filamentis circa 1·3 cm. longis antherisque 7—9 mm. longis. *Ovarium* oblongum, 3—4 mm. longum, supra basin villosum; stylus ad apicem antherarum attingens, ramis conduplicatis spathulatis vel oblanceolatis 3—4 mm. longis.

Corm ovoid, 1·5—2 cm. diam.; tunics of fairly fine reticulate pale brown fibres, with a neck 5—6 cm. long. *Stem* very short, decumbent. *Leaves* 4—5, erect, lanceolate, velutinous, 4—6 cm. long, 3—6 mm. wide, rigid, firmly plicate, somewhat pungent. *Spike* secund, closely 2—5-flowered. *Bract* oblong-lanceolate, acute, 2—2·5 cm. long, herbaceous, velutinous or villous, sometimes with a minute brown mucro; *bracteoles* slightly shorter than the bract, united to above the middle, acuminate, with membranous margins. *Flowers* bilabiate, pale mauve, the lower lateral lobes with a yellow area below the middle outlined with purple at the base; *perianth tube* 1·6—1·8 cm. long, curved near the throat, the upper third or quarter infundibuliform; *lobes* obtuse or subacute, the 3 outer lanceolate, 5—7 mm. wide, mucronate and ciliate on the medial vein outside, the 2 upper 2·4—3·2 cm. long, shortly united with the 3 lower in a lip; 3 inner lobes elliptic-oblong, 0·8—1 cm. wide, the dorsal free, 2·8—3·5 cm. long; 3 lower lobes 2·1—2·7 cm. long, united for 1—2 mm. at the base, the lateral with the margins undulate in the lower half. *Stamens* subarcuate; filaments about 1·3 cm. long; anthers 7—9 mm. long. *Ovary* oblong, 3—4 mm. long, villous above the base; style reaching to top of anthers, with conduplicate spathulate or oblanceolate branches 3—4 mm. long.

B. cedarbergensis is known only from the Cedarberg Mountains, at altitudes of 1,000 to 2,000 m.

TYPE. *Lamb,* N.B.G. 1613/30, in the Bolus Herbarium.

Flowering period. September.

CLANWILLIAM. Cedarberg, near Bushman's Cave: *Lamb,* N.B.G. 1613/30. Near top of Uitkyk Pass in Matjes R. Valley: *Gillett* 4098. Uitkyk Pass: *Stokoe* (55675 a in S. Af. Mus.). Matjesrivier: *Wagener* 197. Krom Rivier: *Stokoe* (61323 in S. Af. Mus.).

The species closely resembles *B. ambigua* in appearance but differs in the following details: (i) The corm tunics extend up in a thick fibrous neck. (ii) The leaves are much firmer, erect and somewhat pungent. (iii) The bracteoles are united to above the middle. (iv) The perianth tube is longer and the ovary villous.

A peculiar structure, which appears to be a free inner membranous lining, has been observed in some of the bracts and bracteoles, but owing to the fragile nature of the tissue and the limited number of specimens collected it has not been possible to dissect them and make a thorough examination.

28. **B. crispa** Lewis (Plate 18), Journ. S.A. Bot. 4: 2 (1938).

Plants usually caespitulose. *Corm* small, narrow-ovoid, about 7 mm. diam.; tunics of fine pale brown or reddish brown fibres, with a fairly thick matted neck 10—14 cm. long. *Stem* very short, less than 1 cm. above ground, simple. *Leaves* 6—8, spreading or suberect, scarcely plicate, spirally twisted with crisped and undulate margins, lanceolate or linear-lanceolate, 3·5—13 cm. long, up to 6 mm. wide, pilose or villous. *Spike* very short, 2—4-flowered. *Bract* lanceolate, acuminate, 2·8—3 cm. long, herbaceous, glabrous or pilose at the base, more or less villous above, the apex brown; *bracteoles* united with short free acuminate tips, slightly shorter than the bract. *Flowers* zygomorphic, more or less bilabiate, pale mauve, the lower lateral lobes yellow in the lower half with a purple W-shaped mark at the base; *perianth tube* 1·4—2 cm. long; *lobes* unequal, the outer obtuse, mucronulate, the inner acute; 3 upper lobes 2·5—3 cm. long, up to 1 cm. wide, the 3 lower slightly shorter and narrower, the 2 lateral with crisped margins. *Stamens* arcuate, reaching half-way up the dorsal lobe; filaments 1·5 cm. long; anthers 6—7 mm. long. *Ovary* glabrous; style reaching to top of anthers, the branches 3—5 mm. long, with oblanceolate conduplicate stigmas.

The plants are usually clustered, in crevices in shale or wedged between stones in hard gravel soil in dry areas east of the Cedarberg and Pakhuis Mountains, from about 400 to 450 m. altitude.

TYPE. *Ross-Frames*, No. 20837 in the Bolus Herbarium.

Flowering period. July.

CLANWILLIAM. Two miles N. of Langekraal on the Clanwilliam–Doornbosch road: *Ross-Frames* (20837 in Herb. Bol.). Near Pakhuis Pass: *Bergh* (21399 in Herb. Bol.). Road from Pakhuis to Wupperthal: *Leipoldt* (20774 in Herb. Bol.). Bidouw River Valley: *Leipoldt* 3873. Langekraal: *Salter*, N.B.G. 1158/32. Near Doornbosch: *Lewis* 1882.

CALVINIA. On hills, farm Tafelberg: *Marloth* 10228 (without flowers, in Nat. Herb., Pretoria).

The year before Ker established the genus Babiana, Sims listed a number of species of Ixia, Gladiolus and Antholyza to be transferred to Babiana by Ker, among them *Gladiolus crispus* Thunb. (see Bot. Mag. sub t. 539 and introduction to this revision), but when Ker established the genus a few months later he stated that *G. crispus* should be excluded from the list. *G. crispus* is *Tritonia crispa* (Thunb.) Ker and as the combination *Babiana crispa* was never made by Ker there can be no objection to using the name for this species.

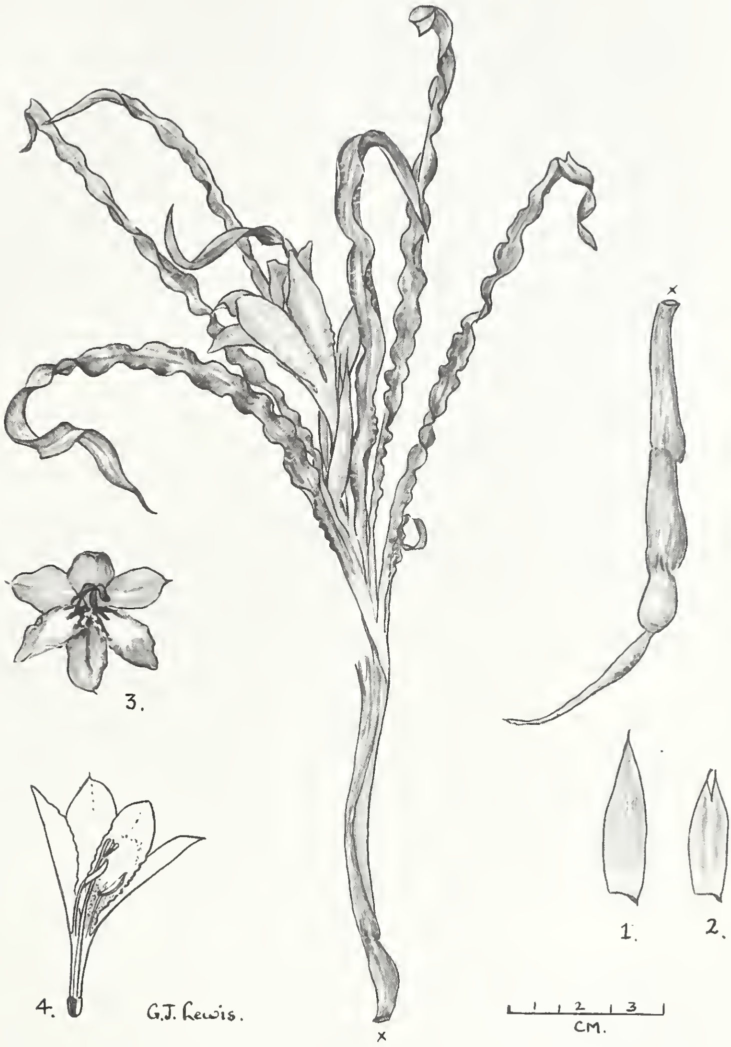

PLATE 18.
B. crispa Lewis. (Slightly reduced.) Plant from Langekraal, Clanwilliam Division, grown in National Botanic Gardens, Kirstenbosch.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower.

29. **B. vanzyliae** L. Bolus, Ann. Bol. Herb. 4: 27 (1925).

Corm ovoid, 1·5—2·2 cm. diam.; tunics of fine reticulate brown or reddish brown fibres, with a neck 4—6 cm. long. *Stem* declinate, pubescent, 1—6 cm. long, simple or occasionally with 1—2 very short branches. *Leaves* 5—7, usually erect or suberect, linear or linear-lanceolate (ensiform in type), acute or acuminate, plicate, pubescent, often velutinous, 3·5—13 cm. long, usually 2—4 mm. wide but up to 1·5 cm. wide in the type. *Spike* short, compact, secund, 2—5-flowered (up to 8 in the type). *Bract* lanceolate, 2·5—4 cm. long, herbaceous, puberulous to densely villous, the apex scariose, ferruginous, acute, acuminate or truncate, sometimes emarginate; *bracteoles* slightly shorter than the bract, with wide hyaline margins, united nearly to the apex. *Flowers* zygomorphic, more or less bilabiate, sulphur-yellow; *perianth tube* slender, usually straight, slightly widened towards the throat, 2·5—3·5 cm. long (5 cm. in type); *lobes* as long as the tube or slightly longer (shorter than tube in type), arising obliquely or the dorsal free and upper lateral very shortly united with the 3 lower in a lip, obtuse or subacute, tapering slightly to the base, the outer narrow-oblong, mucronulate, usually slightly narrower than the inner which are oblong or obovate-oblong; dorsal lobe 3—3·8 cm. long, usually 1—1·3 cm. wide above the middle; 3 lower lobes 2·5—3 cm. long. *Stamens* suberect, yellow; filaments 1·5—1·7 cm. long; anthers 7—8 mm. long. *Ovary* rotund, glabrous or hispidulous on the ribs above the base; style reaching to top of anthers, the branches 3—4 mm. long, with obovate conduplicate stigmas.

Confined to the Calvinia Division where it grows in sandy soil on flats at altitudes of 500 to 650 m.

TYPE. *Van Zyl*, No. 17698 in the Bolus Herbarium.

Flowering period. August—September.

CALVINIA. Willemsrivier, near Nieuwoudtville: *Leipoldt* 813, 3877. Bokkeveld: *Watermeyer*, 5568 in Herb. Marloth. Bokkeveld, near western edge: *Marloth* 7655. Papelfontein, Onder Bokkeveld: *Schlechter* 10910. Three to four miles W. of Nieuwoudtville: *Davis* (59868 in S. Af. Mus.); *Lewis* 2211; *Barker* 6455; *Acocks* 14708. Between Oorlogskloof and Papkuilsfontein: *Leipoldt* 3044. Near Graskop, Nieuwoudtville: *L. Bolus*, N.B.G. 1567/30. Grasberg: *Martin*, N.B.G. 1554/37.

WITHOUT LOCALITY. *Van Zyl* (17698 in Herb. Bol.).

The species was described from a luxuriant garden plant, grown on the Cape Peninsula, which differs from plants collected in the field in having much wider and more spreading leaves, more flowers in the inflorescence and the flowers themselves considerably larger, with a longer perianth tube and wider lobes. The exact locality of its origin is not recorded but it is said to have come from the Clanwilliam Division.

This is probably incorrect, however, as all the localized records are from the Calvinia Division.

Martin, N.B.G. 1554/37, from Grasberg, near Nieuwoudtville, is a colour form in which the 3 upper and middle lower lobes are lilac coloured and the lower lateral lobes yellowish or pale lime-green tipped with mauve.

30. **B. torta** Lewis sp. nov.

Planta caespitulosa. *Cormus* ovoideus, circa 1·5 cm. diam., tunicis e fibris tenuibus reticulatis brunneis in collo 9—10 cm. longo productis, compositis. *Caulis* brevissimus, non 1 cm. longus, floribus fere supra terram ortis. *Folia* 5, disticha, lanceolata, acuminata, 5—8 cm. longa, 0·8—1·2 cm. lata, mollia, leviter undulata, supra medium spiraliter torta. *Spica* secunda, 2—3-flora. *Bractea* lanceolata vel oblongo-lanceolata, acuta, 1·7—2 cm. longa, herbacea, villosa, apice croceo-brunneo; *bracteolae* ultra medium coalitae, bracteae similes et aequales vel leviter longiores. *Flores* irregulares, odorati, pallide lilacini segmentis inferioribus lateralibus luteis supra basin maculis grandis sagittatis purpureis notatis; segmentum infimum parte dimidia inferiore lutea macula lanceolata purpurea; *perianthii tubus* 2 cm. longus, leviter curvatus, superne anguste infundibuliformis; *segmenta* oblique orta, lanceolata, acuta vel subacuta, exteriora mucronulata, dorsale 3—3·4 cm. longum, 8—9 mm. latum, lateralia superiora falcata, 2·3—2·6 cm. longa, 6 mm. lata, 3 inferiora aequalia, 2·2—2·5 cm. longa, 6 mm. lata. *Stamina* subarcuata filamentis circa 1·5 cm. longis antherisque 6 mm. longis. *Ovarium* oblongum, 3—4 mm. longum, glabrum; stylus ad apicem antherarum attingens, ramis 2 mm. longis apice stigmatifero parvo, orbiculato vel cuneato, ciliato.

Plants caespitulose. *Corm* ovoid, about 1·5 cm. diam.; tunics of fine reticulate brown fibres, with a thin neck 9—10 cm. long. *Stem* less than 1 cm. long, the flowers arising just above ground. *Leaves* 5, distichous, arranged fan-wise, lanceolate, acuminate, 5—8 cm. long, 0·8—1·2 cm. wide, soft in texture, villous, slightly undulate, spirally curled above the middle. *Spike* secund, 2—3-flowered. *Bract* lanceolate or oblong-lanceolate, acute, 1·7—2 cm. long, herbaceous, villous, the apex pale orange-brown; *bracteoles* similar to the bract and as long or slightly longer, united to above the middle. *Flowers* zygomorphic, very pale mauve, the lower lateral lobes yellow with a large purplish sagittate outline in the lower half, the lowest yellow to the middle with a purplish lanceolate outline, fragrant; *perianth tube* 2 cm. long, slightly curved, the upper half narrowly infundibuliform; *lobes* arising obliquely, lanceolate, acute or subacute, the outer mucronulate, the dorsal 3—3·4 cm. long, 8—9 mm.

wide, the upper lateral falcate, 2·3—2·6 cm. long, 6 mm. wide; 3 lower lobes equal, 2·2—2·5 cm. long, 6 mm. wide. *Stamens* subarcuate; filaments about 1·5 cm. long; anthers linear, 6 mm. long. *Ovary* oblong, 3—4 mm. long, glabrous; style reaching top of anthers, with branches 2 mm. long and small orbicular or cuneate ciliate stigmas.

There is only one record, from the southern part of Namaqualand, growing under rock slabs, north aspect.

TYPE. *Hall*, N.B.G. 385/54, in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. May.

NAMAQUALAND. Between Kliprand and Brakfontein, about 10 miles E. of Kliprand (Nieuwefontein): *Hall*, N.B.G. 385/54.

This species is near *B. namaquensis* Baker but has much wider leaves, villous bracts and bracteoles, and much paler flowers. The flowering period is three months earlier.

31. **B. pilosa** Lewis sp. nov. (Plate 19).

Cormus globosus vel subglobosus, 2—2·5 cm. diam., tunicis concretis e fibris tenuibus rubido-brunneis in collo denso 9—12 cm. longo productis, compositis. *Caulis* gracilis, angulatus, declinatus, plerumque simplex, circa 8 cm. longus, superne villosus pilis plus minusve retrorsis. *Folia* 6, ascendentia vel suberecta, petiolis supra terram per 3—5 cm. productis et laminis lanceolatis acuminatis 5—7 cm. longis, 3—6 mm. latis, exigue pilosis sed marginibus basin versus sat dense pilosis, non vel vix plicatis, sat prominenter 1—3-nervatis. *Spica* secunda, sat dense 2—5-flora floribus leviter tortis et ad apicem caulis aspicientibus. *Bractea* lanceolata, acuta vel acuminata, 2—3 cm. longa, sexta vel quarta parte superiore ferruginosa scariosa glabra, inferne herbacea basin versus pilis plus minusve retrorsis vestita; *bracteolae* quam bractea aequilongae, coalitae apicibus liberis acuminatis ferruginosis scariosis, marginibus hyalinis, basin versus exigue pubescentes. *Flores* bilabiati, pallide miniano-rubentes, segmentis inferioribus lateralibus basin versus luteis; *perianthii tubus* leviter curvatus, infundibuliformis, 1·5—1·8 cm. longus; *segmenta* plus minusve lanceolata, obtusa, exteriora mucronata, dorsale liberum 3—3·4 cm. longum, 7—8 mm. latum, 2 lateralia superiora 2·3—2·8 cm. longa, 4—5 mm. lata, cum 3 inferioribus in labio breviter coalita; 3 inferiora subunguiculata, 2—2·8 cm. longa, 4—6 mm. lata, basi per 2—4 mm. in unguem latum coalita, 2 lateralia marginibus basin versus leviter undulatis. *Stamina* arcuata filamentis circa 1·5 cm. longis antherisque 6 mm. longis. *Ovarium* rotundum, 3 mm. longum, glabrum vel nervis minute pubescentibus; stylus ad medium antherarum attingens, ramis oblanceolatis conduplicatis 5 mm. longis.

Corm globose or subglobose, 2—2·5 cm. diam.; tunics matted, of fine reddish brown fibres, with a thick matted neck 9—12 cm. long. *Stem* slender, angled, declinate, usually simple, about 8 cm. long, the upper half villous with more or less retrorse hairs. *Leaves* 6, ascending or suberect, with petioles 3—5 cm. long above ground and lanceolate acuminate blades 5—7 cm. long, 3—6 mm. wide, very sparsely pilose but with the margins at the base fairly densely pilose, not or scarcely plicate, somewhat prominently 1—3-veined. *Spike* secund, with 2—5 fairly closely arranged flowers turned to face the apex of the stem. *Bract* lanceolate, acute or acuminate, 2—3 cm. long, the upper sixth or quarter ferruginous and scariose, herbaceous below, pilose with more or less retrorse hairs near the base, glabrous above; *bracteoles* as long as the bract, united with free ferruginous scariose acuminate tips and hyaline margins, sparsely pubescent at the base and on the medial veins above. *Flowers* bilabiate, magenta-pink, the lower lateral lobes yellow at the base; *perianth tube* slightly curved, infundibuliform, 1·5—1·8 cm. long; *lobes* more or less lanceolate, obtuse, the outer mucronate; dorsal lobe free, 3—3·4 cm. long, 7—8 mm. wide; upper lateral lobes 2·3—2·8 cm. long, 4—5 mm. wide, shortly united with the 3 lower in a lip; 3 lower lobes subunguiculate, 2—2·8 cm. long, 4—6 mm. wide, united for 2—4 mm. in a wide claw, the lower lateral with the margins in the lower half slightly undulate. *Stamens* arcuate; filaments about 1·5 cm. long; anthers 6 mm. long. *Ovary* rotund, 3 mm. long, glabrous or sparsely and minutely pubescent on the ribs; style reaching to middle of anthers, with oblanceolate conduplicate branches 5 mm. long.

Only once recorded, from the north-western part of the Vanrhynsdorp Division.

TYPE. *Hall*, N.B.G. 414/56 in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August.

VANRHYNSDORP. Fifteen miles W. of Nuwerus: *Hall*, N.B.G. 414/56.

A distinct species somewhat resembling *B. stenomera* (section Exohebeoides), but with pilose leaves, the stem declinate, and larger bracts and flowers.

32. **B. auriculata** Lewis sp. nov.

Cormus ovatus, 0·6—1·5 cm. diam., tunicis e fibris brunneis tenuibus reticulatis in collo 10—15 cm. longo productis, compositis. *Caulis* gracilis, 3—10 cm. longus, ad medium foliis opertus, pilosus, plerumque plus minusve declinatus, simplex vel 1—2 ramis brevissimis. *Folia* 6—8, erecta vel suberecta, lanceolata, acute cuspidata, 5—8 cm. longa, 3—5 mm. lata, plus minusve plicata, pilis mollibus brevibus longisque vestitis. *Spica*

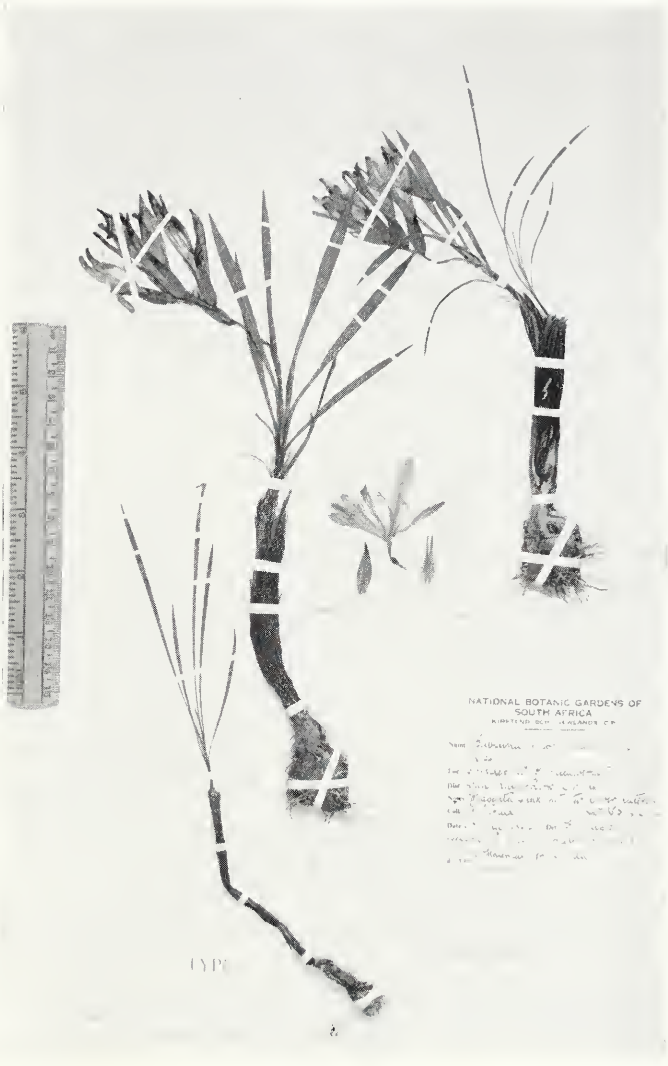

PLATE 19.
B. pilosa Lewis. Type sheet, in the Compton Herbarium.

brevis, secunda, 3—8-flora. *Bractea* lanceolata, herbacea, acuta vel cuspidata, 1·3—2·5 cm. longa, 3—4 mm. lata, pubescens, tertia parte superiore scariosa, ferruginosa; *bracteolae* quam bractea leviter breviores, ad medium vel parum ultra coalitae, carinatae, apicibus ferruginosis apiculatis et marginibus sat latis hyalinis. *Flores* bilabiati segmentis valde inaequalibus, segmenta superiora lilacina, tubus et segmenta inferiora pro parte majore luteus, perianthii tubo torto itaque segmenta superiora et stamina ad apicem caulis aspicientia; *perianthii tubus* rectus, 1·5—2 cm. longus, superne infundibuliformis; *segmenta* obtusa, exteriora plus minusve oblanceolata, mucronata, 3—5 mm. lata, segmentum dorsale (ad apicem caulis aspiciens) liberum, 2—2·8 cm. longum, apicem et basin versus 5—9 mm. latum medio angustius; segmenta lateralia superiora 1·5—2 cm. longa, cum 3 inferioribus in labio breviter coalita; 3 inferiora unguiculata unguibus per 5 mm. coalitis et laminis 1—1·5 cm. longis, 2 lateralibus oblongis ad 6 mm. latis basin versus late auriculatis. *Stamina* arcuata, filamentis 1·5—1·8 cm. longis antherisque 4—6 mm. longis. *Ovarium* oblongum vel rotundum, 3 mm. longum, basin versus glabrum superne nervis villosis; stylus ad medium vel apicem antherarum attingens, ramis filiformibus 3—4 mm. longis apice stigmatifero parvo obovato conduplicato.

Corm ovate, 0·6—1·5 cm. diam.; tunics of fine brown reticulate fibres, with a neck 10—15 cm. long. *Stem* slender, usually more or less declinate, 3—10 cm. long, pilose or villous, simple or with 1—2 short branches, the lower half enclosed in the leaves. *Leaves* 6—8, erect or suberect, lanceolate with a sharp cusp, more or less plicate, 5—8 cm. long, 3—5 mm. wide, pubescent with short and long silky hairs. *Spike* short, secund, 3—8-flowered. *Bract* lanceolate, acute or cuspidate, 1·3—2·5 cm. long, herbaceous, villous, the upper third or quarter scariose and ferruginous; *bracteoles* slightly shorter than the bract, united to the middle or shortly above, carinate, apiculate, with fairly wide hyaline margins, the apex ferruginous. *Flowers* turned to face the stem apex, bilabiate with very unequal lobes, the upper lobes mauve-blue, the perianth tube and lower lobes yellow, the latter tipped with mauve; *perianth tube* straight, 1·5—2 cm. long, the upper half infundibuliform; *lobes* obtuse, the outer more or less oblanceolate, mucronate, 3—5 mm. wide; dorsal lobe free, 2—2·8 cm. long, 5—9 mm. wide near the base and apex, narrower at the middle; upper lateral lobes 1·5—2 cm. long, shortly united with the 3 lower in a lip; 3 lower lobes unguiculate with the claws united for about 5 mm., the blades 1—1·5 cm. long, the 2 lateral oblong, up to 6 mm. wide with wide, rounded incurved auriculate lobes at the base. *Stamens* arcuate; filaments 1·5—1·8 cm. long; anthers 4—6 mm. long. *Ovary* oblong or rotund, 3 mm. long, villous on the nerves

in the upper half, glabrous below; style reaching to middle or top of anthers, the branches filiform, 3—4 mm. long, with small obovate conduplicate stigmas.

Very local on the Pakhuis Mountains, wedged among rocks in damp places at about 830 m. altitude.

TYPE. *Lewis* 1878 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. September.

CLANWILLIAM. Pakhuis Pass: *Thorne* (52681 in S. Af. Mus.); *Lewis* 1878, and 22246 in Herb. Bol.; *Salter* 7518; *Bond* 602; *Barker* 279, 1129, 4710; *Esterhuysen* 3194, 8010.

This species appears to be very local, all the records being from the same locality. It is allied to *B. mucronata* from which it differs in having much longer hairs on the leaves and stem, the bracteoles united and the lower lateral perianth lobes distinctly auriculate.

33. **B. horizontalis** Lewis sp. nov.

Cormus circa 2 cm. diam., tunicis concretis e fibris tenuibus reticulatis rubido-brunneis in collo 8 cm. longo productis, compositis. *Caulis* omnino subterraneus, simplex, glaber. *Folia* 4 vel amplius, glabra, petiolis supra terram per 2—3 cm. productis, laminis horizontalibus, anguste oblongis, acutis, 3·5 cm. longis, 1·3 cm. latis, sat prominenter 3—4-nervatis, non vel vix plicatis. *Spica* 1-flora. *Bractea* lanceolata, acuminata, herbacea, glabra, dense striata, 2·5 cm. longa; *bracteolae* coalitae, bracteae similes sed apice membranacea et bifida. *Flores* irregulares segmentis exterioribus obscure lilacinis et interioribus sulphureis; *perianthii tubus* 2·5 cm. longus, ad fauces leviter ampliatus; *segmenta* oblique orta, dorsale lanceolatum, acutum, apiculatum, 2·7 cm. longum, lateralia superiora oblanceolata, subacuta, mucronata, 2·3 cm. longa, circa 5 mm. lata. *Stamina* suberecta, ad medium segmenti dorsalis attingentia antheris declinatis 6 mm. longis. *Ovarium* non visum; stylus leviter supra apicem antherarum attingens, ramis spathulatis conduplicatis 3—4 mm. longis.

Corm about 2 cm. diam.; tunics matted, of fine reddish brown united fibres, with a neck 8 cm. long, apparently extending 2—3 cm. above ground. *Stem* entirely subterranean, simple, glabrous. *Leaves* 4 or more, glabrous, the petiole extending 2—3 cm. above ground, the blade arising more or less at a right angle, horizontal, narrow-oblong, acute, 3·5 cm. long, 1·3 cm. wide, fairly prominently 3—4-veined, not or only slightly plicate. *Spike* 1-flowered. *Bract* lanceolate, acuminate, herbaceous, glabrous, closely striate, 2·5 cm. long; *bracteoles* united, like the bract but the apex membranous, bifid. *Flowers* zygomorphic, the outer lobes dull lilac, the inner sulphur yellow; *perianth tube* 2·5 cm. long, slightly widened towards the throat; *lobes* arising obliquely, the dorsal lanceolate, acute, apiculate, 2·7 cm. long, the upper lateral oblanceolate, subacute, mucronate, 2·3 cm. long, about 5 mm. wide. *Stamens* suberect, reaching to the middle of the dorsal lobe, the anthers declinate, 6 mm. long. *Ovary* not seen; style reaching shortly above the anthers, with spathulate conduplicate branches 3—4 mm. long.

Only once recorded from Namaqualand.

TYPE. *Alston*, Herb. Marloth 4568, in the National Herbarium, Pretoria.

Flowering period. June.

NAMAQUALAND. Anenous: *Alston*, Herb. Marloth 4568.

A very distinct species described from a single incomplete herbarium specimen.

34. **B. socotrana** Hook. f., Bot. Mag. t. 6585 (1881); Baker Handbk. Irid. 183 (1892); Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895).

Corm globose or subglobose, 1·5—2 cm. diam.; tunics matted, of firmly reticulate brown fibres, with a neck 1·5—5 cm. or more long. *Stem* very short, simple. *Leaves* 3—5, with fairly wide compressed conduplicate petioles extending shortly above ground, the blades lanceolate, acuminate, 5—11·5 cm. long, 0·7—1 cm. wide, rigid, plicate, glabrous or minutely puberulous on some of the nerves. *Spike* compact, 1—3-flowered. *Bract* lanceolate, herbaceous, glabrous, with a short or long foliaceous acuminate awn, 2·5—7 cm. long (including awn); *bracteoles* united, much shorter than bract. *Flowers* bilabiate, pale mauve-blue; *perianth tube* straight, slender, cylindrical, slightly expanded towards the throat, 2·8—3 cm. long; *lobes* elliptic, acute, subequal, about half as long as the tube. *Stamens* shortly exserted from perianth tube, reaching nearly to middle of the dorsal lobe. *Ovary* glabrous; style reaching to middle of anthers, with oblanceolate branches about 3 mm. long.

TYPE. *Balfour* in Kew Herbarium.

Flowering period. February—March.

ISLAND OF SOCOTRA. *Balfour* 249.

There are two specimens in Kew Herbarium, the type which was grown at Kew and figured in the Botanical Magazine, and a fruiting specimen without a corm from Socotra, both collected by Balfour. In the latter the petioles are much narrower than in the cultivated plant, and although the corm is missing it is evident from the long slender subterranean part of the stem on this specimen that the corm was situated 5 cm. or more below the ground surface. The glabrous or almost glabrous leaves and long glabrous foliaceous cusps of the bracts are two characters which do not occur together in any of the South African species.

35. **B. fourcadei** Lewis, S.A. Gard. & Country Life 24: 268 (1934).

Corm ovoid, usually 1·3—2 cm. diam.; tunics of fine to fairly coarse brown or reddish brown fibres, with a hard, dark brown narrow cylindrical neck 6—12 cm. long. *Stem* erect, 7—15 cm. high (sometimes to 25 cm.), the lower third or half enclosed in the leaves, pubescent, usually with 1—3 very short erect branches. *Leaves* 7—10, distichous, patent or suberect, lanceolate, acuminate, plicate, pubescent, 6—13 cm. long, 0·4—1 cm. wide. *Spike* distichous, laxly or fairly closely 4—10-flowered. *Bract* lanceolate, acuminate, 1·4—2 cm. long, carinate, herbaceous, pubescent, the apex scariose and ferruginous; *bracteoles* free, similar to the bract but slightly shorter and much narrower, with narrow hyaline margins. *Flowers* bilabiate, pale mauve, the lower lobes yellow with small violet markings at the base, fragrant; *perianth tube* 2·5—3 cm. long, widened slightly from base to throat, with a slight curve shortly below the throat; *lobes* oblong or oblanceolate-oblong, widest near the apex, tapering downwards and more or less unguiculate, obtuse, the outer with a dark and usually somewhat conspicuous mucro; 3 upper lobes 2—2·5 cm. long, 5—8 mm. wide, the dorsal free and slightly longer than the 2 lateral which are shortly united with the 3 lower in a lip; 3 lower lobes 1·8—2 cm. long, 5—7 mm. wide, united for about 2 mm. at the base. *Stamens* arcuate; filaments about 1·7 cm. long; anthers 5—7 mm. long. *Ovary* oblong-rotund or turbinate, 3—4 mm. long, glabrous; style reaching to top of anthers or above, with oblanceolate conduplicate branches 3—4 mm. long.

On hills and low mountain slopes from the Riversdale to George and Oudtshoorn Divisions.

TYPE. *Fourcade* 4765 in the Bolus Herbarium.

Flowering period. September—October.

RIVERSDALE. Garcias Pass: *Galpin* 4704; *Thorne* (41606 in S. Af. Mus.); *Acocks* 15418.

MOSSEL BAY. Near Mossel Bay: *Rodin* 1331; *Sidey* 1744. Ruytersbosch: *Van Niekerk* 96. Cloetes Pass: *Muir* 2390.

GEORGE. Hills E. of Great Brak River: *Fourcade* 4765, 5245. Wilderness: *Compton* 15831. W. side of Kaymans Gat: *Burchell* 5806. Outeniquas Kloof: *Gill.* George: *Stephany* (17056 in Herb. Bol.).

OUDTSHOORN. Mountains near Oudtshoorn: *Taylor* (10055 in Herb. Bol.).

This species differs from *B. plicata* and *B. patersoniae*, which it somewhat resembles, in having a slightly longer perianth tube, more irregular lobes and the ovary glabrous.

36. **B. sambucina** (Jacq.) Ker in Konig & Sims Ann. 1: 234 (1805),

Gen. Irid. 152 (1827) and Bot. Mag. t. 1019 (1807); Spreng. Syst. 1: 155 (1825); Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 181 (1892) and Fl. Cap. 6: 109 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895). *Gladiolus sambucinus* Jacq. Hort. Schoenbr. t. 15 (1797); Vahl Enum. 2: 117 (1806); Poir. in Lam. Encyc. Suppl. 2: 794 (1812); Roem. & Schult. Syst. 1: 442 (1817). *Babiana stellata* Schltr. in Engl. Bot. Jahrb. 27: 99 (1900). *B. Gawleri* N. E. Br. in Hook. Ic. Pl. 28, sub t. 2710 (1905). *B. spathacea* Ker, Bot. Mag. t. 638 (1803), fig., excl. syn. *B. mucronata* (Jacq.) Ker var. *longicollis* Baker Handbk. Irid. 183 and Fl. Cap. 6: 111; Dur. & Sch. l.c. 199.

Corm ovoid, 2—3 cm. diam.; tunics matted, of fairly coarse reddish brown fibres, with a neck 8—10 cm. long, sometimes to 15 cm. *Stem* seldom extending more than 1 or 2 cm. above ground, angled, glabrous or hispidulous on the angles, simple or with 1—2 very short branches arising below ground. *Leaves* 5—6, erect or suberect, linear or lanceolate, rarely ensiform, acute or acuminate, 4—14 cm. long, 3—7 mm. wide or occasionally up to 1·2 cm., hispidulous or pubescent, plicate, firm, sometimes somewhat pungent. *Spike* short, compact, 2—6-flowered. *Bract* lanceolate, acute or acuminate, 2·5—4 cm. long, the lowest sometimes with a foliaceous awn and up to 6 cm. long, sometimes carinate, herbaceous, varying from subglabrous to pubescent with short or long silky hairs; *bracteoles* almost entirely united with free setaceous sphacelate tips, bicarinate, as long as the bract or slightly shorter or longer. *Flowers* zygomorphic, pale blue-mauve, violet or purple, with a white mark near the middle on the lower lateral lobes, fragrant; *perianth tube* straight or nearly so, 3—5 cm. long, widened gradually upwards from 1 mm. diam. at the base to 3—5 mm. diam. at the throat, up to 1 cm. longer than the lobes; *lobes* subequal or if arising slightly obliquely then the dorsal slightly longer than the others, all elliptic-oblong, oblong or sometimes obovate-oblong, obtuse or subacute, rarely acute, 2—3·5 cm. long, 0·5—1·2 cm. wide (rarely to 1·6 cm. wide), usually about 3 cm. long and 0·8—1 cm. wide, the outer mucronulate. *Stamens* subarcuate; filaments 1—1·5 cm. long; anthers yellow, 0·7—1 cm. long. *Ovary* oblong or rotund, 4—5 mm. long, glabrous; style reaching to base or top of anthers, with conduplicate linear-oblanceolate or oblanceolate branches 4—5 mm. long.

On sandy flats or sometimes in rock crevices on hills at altitudes of 650 to 1,150 m. in inland districts extending from Calvinia and Ceres eastwards to Port Elizabeth, and at low altitudes in southern coastal districts from Knysna to Port Elizabeth.

TYPE. Jacquin Hortus Schoenbr. t. 15.

Flowering period. July—September.

CALVINIA. Hantam Mt.: *Marloth* 12792.

CERES. Cold Bokkeveld: *Marloth* 6171, 10607; *Schlechter* 8856 (type of *B. stellata*, in Berlin-Dahlem Herb.). Elandsfontein, Cold Bokkeveld: *Lewis* 2649; *Middelmost* 1723. Top of Gydo Pass: *Leighton* (21469 in Herb. Bol.); *Hafstrom* and *Acocks* 274; *Leipoldt* 3046, 4064, 4065. Theronsberg: *Marloth* 3319. Laaken Vlei: *Barker* 1130. Ertjieslandkloof: *Barker* 3027.

WORCESTER. Hex River Valley: *Bybee*. Between Touws River and Karroopoort: *Dymond*, N.B.G. 1961/33. Matroosberg: *Acocks* 15521.

Montagu. Eendracht: *Lewis* 4799; *Compton* 18373.

BEAUFORT WEST. Nieuweveldberg: *Drege* 8395.

LAINGSBURG. Between Seven Weeks Poort and Klein Swartberg: *Lewis* and *Barker*, N.B.G. 2674/32. Whitehill: *Compton* 2699, 2856, 11256. Tweedside: *Lewis* and *Barker*, N.B.G. 2695/32; *Barker* 7486.

PRINCE ALBERT. Karoo near Prince Albert: *Stokoe* (68428 in S. Af. Mus.); *Krige*, N.B.G. 4346/14, 1468/16; *Marchand* in Herb. Marloth 10209. Klaarstroom: *Drege* 8395.

OUDTSHOORN. Hills near Kamanassie Dam: *Lewis* 4415. Between Cango and De Rust: *Thorne* (53366 in S. Af. Mus.). Oudtshoorn, Rhenosterveld: *Marloth* 13201. Moras River: *Hops* 21.

LADISMITH. Van Wyksdorp: *Barker* 5506. Seven Weeks Poort: *Phillips* 1544. Little Karoo N. of Rooiberg: *Wurts* 1226. Buffels Kloof, Swartberg: *Esterhuysen* 14006.

GEORGE. Waboomskraal, near top of Outeniqua Pass: *Lewis* 4458. Great Doorn River: *Thorne* (51705 in S. Af. Mus.).

KNYSNA. Plettenberg Bay: *Derbyshire* (22317 in Herb. Bol.).

UNIONDALE. Hills near Avontuur: *Fourcade* 1648.

UITENHAGE. *Thode* A 2674; *Willson* (22319 in Herb. Bol.).

HUMANSDORP. *Rogers* 2953.

PORT ELIZABETH. Cape road: *Long* 437. Port Elizabeth and Redhouse: *Paterson* 2553. New Brighton, near Port Elizabeth: *West* 333. Port Elizabeth: *Paterson* 39 b; *Cory* (22312, 22318, 22320 in Herb. Bol.).

ALEXANDRIA. Addo bush, near Kenkelbosch: *Story* 2726.

WITHOUT LOCALITY. *Verreaux*.

The type, depicted by Jacquin, is obviously a cultivated plant and is considerably more elongated than normal, with a laxer spike. In the fairly dry areas where the species most commonly occurs the stem is abbreviated, seldom extending more than 1—2 cm. above ground, and the spike is short and compact. The plant figured by Ker, Bot. Mag. t. 638, represents the more usual form. There has been some difference of opinion about the plant figured by Ker, which he mistakenly identified with *Gladiolus spathaceus* L. f. (=*Babiana spathacea*, a species with a long dense spike and entirely membranous bracts). Baker placed it as

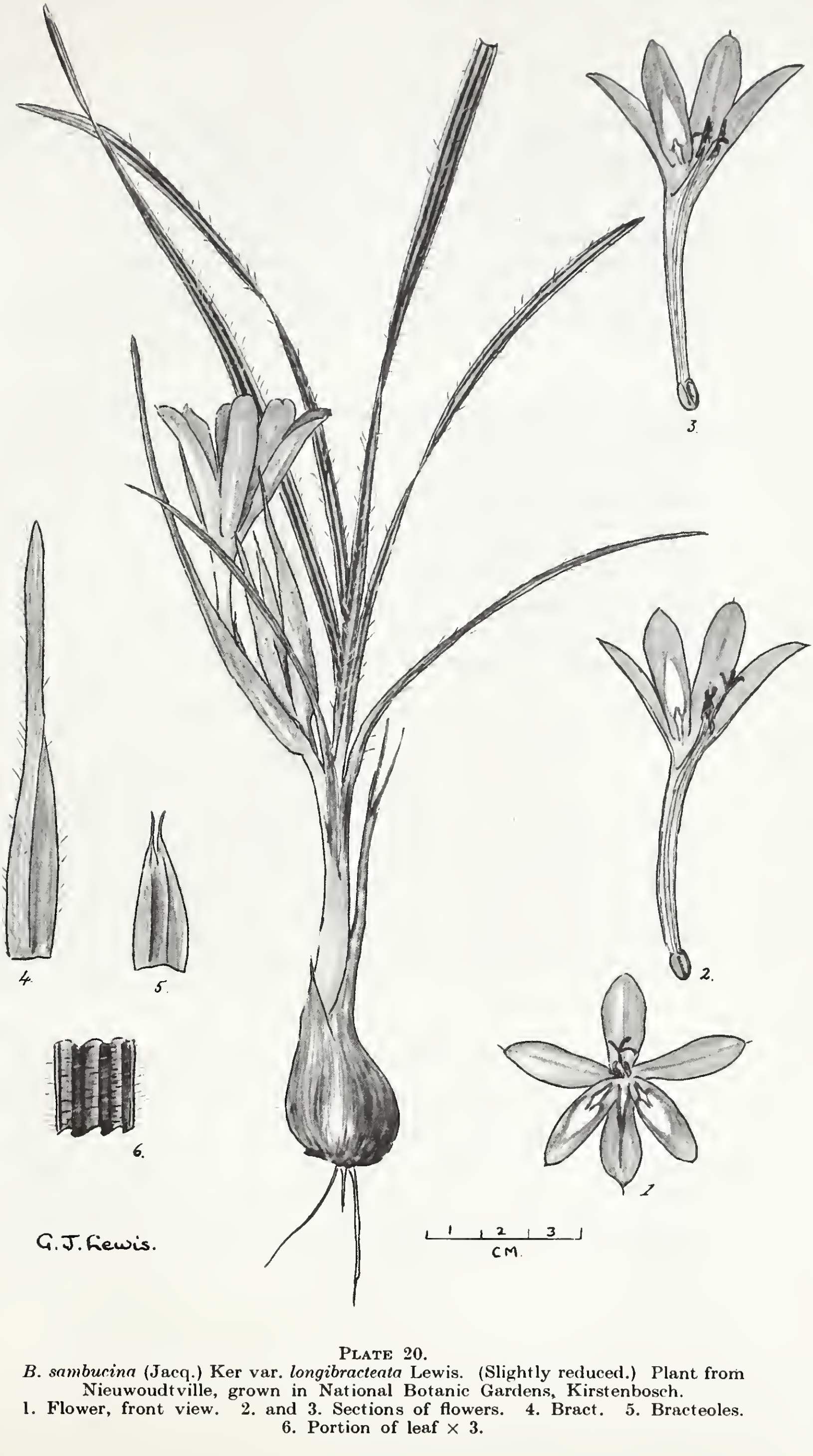

PLATE 20.
B. sambucina (Jacq.) Ker var. *longibracteata* Lewis. (Slightly reduced.) Plant from Nieuwoudtville, grown in National Botanic Gardens, Kirstenbosch.
1. Flower, front view. 2. and 3. Sections of flowers. 4. Bract. 5. Bracteoles.
6. Portion of leaf × 3.

a variety of *B. mucronata*, and some years later it was described as a new species and named *B. Gawleri* by N. E. Brown. There is no doubt, however, that it is merely a colour form of *B. sambucina*, a very widespread and somewhat variable species in which the flowers vary from pale blue or mauve to purple or violet. In its widespread distribution and the varieties which occur, *B. sambucina* is a southern counterpart of *B. hypogea*, to which it is closely allied, the main difference being that the flowers arise at or above the ground surface in *B. sambucina* and shortly below ground in *B. hypogea*.

B. sambucina (Jacq.) Ker var. **longibracteata** Lewis stat. nov. (Plate 20). *B. longibracteata* Lewis, S.A. Gard. & Country Life 22: 243 (1932).

Differs from var. *sambucina* in having longer and narrower leaves, extending well above the flowers, densely pubescent with long silky hairs more or less directed upwards and adpressed to the leaf. *Leaves* 11—30 cm. long, 2—6 mm. wide. *Bract* sometimes with a short or long foliaceous awn, densely villous, 3·5—4 cm. long, the lowest sometimes 6—15 cm. long. *Flowers* lilac coloured, with a large white cordate-lanceolate mark on the lower lateral lobes; *perianth tube* 4—5·5 cm. long; *lobes* 3—4 cm. long, 0·7—1·2 cm. wide. *Stamens* with filaments 1·5—2 cm. long and white anthers.

Sandy soil on flats in the Calvinia Division, at altitudes of about 650 to 750 m.

Type. *L. Bolus*, No. 19803 in the Bolus Herbarium.

Flowering period. August—September.

Calvinia. Top of Vanrhyns Pass: *Diels* 583. Lokenburg: *Acocks* 17009; *Leistner* 320. Vanrhynsdorp to Bokkeveld: *Pritzel*. About 10 miles N. of Nieuwoudtville on road to Grasberg: *L. Bolus* (19803 in Herb. Bol.). Near Nieuwoudtville: *Marloth* 7483 a; *Leipoldt* 819; *Lewis* 1884, 2210; *Barker* 6452; *Theron* 1259; *Acocks* 14707. Between Nieuwoudtville and Oorlogskloof: *Leipoldt* 3879. Between Oorlogskloof and Papkuilsfontein: *Leipoldt* 3045. Oorlogskloof: *Schlechter* 10959.

B. sambucina (Jacq.) Ker var. **unguiculata** Lewis var. nov.

Folia latiora, lanceolata vel ensiformia, acuminata, 12—30 cm. longa, 0·7—1·3 cm. lata. *Bractea* carinata, dense villosa, 3—4 cm. longa, infima interdum ad 6·5 cm. longa arista foliacia ornata. *Flores* distinctius irregulares, violacei segmentis lateralibus inferioribus medium versus albo-notatis; *perianthii tubus* 3·8—5·5 cm. longus; *segmenta* oblique orta, supremum quam 3 inferiora 5—6 mm. longius ceteroqui omnia similia, oblanceolata vel obovato-oblanceolata, plus minusve unguiculata, acuta vel subacuta, 0·7—1·2 cm. lata, exteriora mucronata, dorsale 3·5—3·8 cm. longum. *Filamenta* 1·5—2 cm. longa; antherae 5—7 mm. longae.

Leaves wider, lanceolate or ensiform, acuminate, 12—30 cm. long, 0·7—1·3 cm. wide. *Bract* carinate, densely villous, 3—4 cm. long, the lowest sometimes up to 6·5 cm. long terminating in a foliaceous awn. *Flowers* more distinctly zygomorphic, violet-coloured, the lower lateral lobes with a white mark above the middle; *perianth tube* 3·8—5·5 cm. long; *lobes* arising obliquely, the uppermost 5—6 mm. longer than the 3 lower otherwise all alike, oblanceolate or obovate-oblanceolate, more or less unguiculate, acute or subacute, 0·7—1·2 cm. wide, the outer mucronate, the dorsal 3·5—3·8 cm. long. *Filaments* 1·5—2 cm. long; anthers 5—7 mm. long.

Rock crevices in the Calvinia Division at 830 m. altitude.

TYPE. *Lewis* 2650 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. September.

CALVINIA. Top of Botterkloof Pass: *Lewis* 2209, 2650; *Barker* 6499. Oorlogskloof, near Nieuwoudtville: *Barker*, N.B.G. 1568/30.

B. sambucina (Jacq.) Ker var. **undulato-venosa** (Klatt) Lewis stat. nov. *B. undulato-venosa* Klatt, Abh. Naturf. Ges. Halle 12: 350 (1882); Erganz. 16 (1882); Dur. & Sch. Consp. Fl. Afr. 5: 202 (1895).

Leaves erect, lanceolate or linear-lanceolate, firm, plicate, puberulous, not overtopping the flowers. *Bract* lanceolate, 3 cm. long, densely villous. *Flowers* purple; *perianth tube* 5·5—6·5 cm. long; *lobes* arising slightly obliquely, subequal, about 3 cm. long.

Hills in the Knysna and Humansdorp Divisions.

NEOTYPE. *Fourcade* 2311 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August—September.

KNYSNA. Plettenberg Bay: *Derbyshire* (22317 in Herb. Bol.); *Smart* in Herb. *Rogers* 26693.

HUMANSDORP. Companys Drift: *Fourcade* 2311.

The type of *B. undulato-venosa* in Herb. Lubeck, Berlin-Dahlem Herbarium, was destroyed, and no isotypes have been seen. Klatt gave no locality for the type but the collector, Miss Newdegate, lived in Knysna and collected largely in that district. The specimens cited above, from the Knysna-Humansdorp Divisions, agree with Klatt's description and I think there can be little doubt that they are the same as his *B. undulato-venosa*. This cannot, however, be regarded as more than a long-tubed variety of *B. sambucina*, very closely allied to the variety *longibracteata*, from which it differs in having shorter leaves, with shorter pubescence, and the bracts, as far as is known, without foliaceous awns.

37. **B. framesii** L. Bolus, S.A. Gard. & Country Life 22: 276 (1932). *B. Gawleri* L. Bolus, l.c. 17: 374 (1927), fig.; non N. E. Br. (1905).

Corm ovoid or subglobose, 2—3 cm. diam.; tunics of fairly firm matted reddish brown fibres, with a neck 8—12 cm. long. *Stem* very short, seldom more than 1 or 2 cm. above ground, angled, glabrous or puberulous on the angles, simple or with 1—2 very short branches arising below ground. *Leaves* 6—7, erect or suberect, lanceolate or ensiform, acute or acuminate, 4—12 cm. long, 0·7—1·4 cm. wide, fairly rigid, plicate, shortly pubescent. *Spike* short, compact, the bracts closely imbricate, 3—8-flowered. *Bract* lanceolate, acuminate, 4—5 cm. long, the lowest sometimes with a foliaceous awn and up to 6 cm. long, herbaceous, the apex sometimes sphacelate, pubescent with short or long and silky hairs; *bracteoles* united with free setaceo-acuminate tips, usually as long as the bract. *Flowers* zygomorphic, purple, the lower lateral lobes with a white sagittate mark near the middle, usually with a red line extending up into the white area; *perianth tube* 6—7 cm. long, about twice as long as the lobes, very slender, slightly curved shortly below the throat, cylindrical to the curve and above very slightly widened to the throat; *lobes* patent, the upper half usually recurved, oblanceolate or elliptic-oblanceolate, acute or acuminate, 2·3—3·3 cm. long, 5—9 mm. wide, the outer mucronate and 1—2 mm. narrower than the inner, nearly equal in length or the dorsal 2—3 mm. longer than the others. *Stamens* suberect, reaching nearly to middle of dorsal lobe; filaments 1—1·2 cm. long; anthers 7—9 mm. long. *Ovary* oblong-rotund, 4—5 mm. long, glabrous; style reaching to middle or top of anthers, with oblanceolate conduplicate branches 4 mm. long.

Among rocks on hills in the Calvinia Division at altitudes of about 700 to 900 m.

TYPE. *Ross-Frames*, N.B.G. 1244/26, in the Bolus Herbarium.

Flowering period. September.

CALVINIA. Near Nieuwoudtville: *Ross-Frames*, N.B.G. 1244/26; *Marloth* 7483 b; *Buhr*, N.B.G. 599/33. Klipkoppies, near Nieuwoudtville: *L. Bolus* (19800 in Herb. Bol.); *Lavis*, N.B.G. 1592/30.

B. framesii differs from *B. sambucina* in having a longer and more cylindrical perianth tube with a slight curve just below the throat, nearly twice as long as the lobes which are more acute, the outer narrower than the inner. The flowers have little or no scent whereas in *B. sambucina* they are very sweetly scented.

Rogers 11114, in the Zürich University Herbarium, from Mr. Pillans' garden, is said to come from Malmesbury but this is a mistake—it is possibly from the type collecting, presented to Mr. Pillans by Mr. Ross-Frames.

B. framesii L. Bolus var. **kamiesbergensis** Lewis var. nov.

Folia angustiora petiole gracili supra terram per 1—3 cm. producto, pilosa, linearia vel lanceolata, acuminata, plerumque pungentia, 5—15 cm. longa, 3—6 mm. lata. *Bractea* minute hirsuta, acuta, acuminata vel cuspidata, 2·5—4 cm. longa, infima plerumque ad 6 cm. longa arista subulata 1—2 cm. longa ornata. *Flores* lilacini segmentis inferioribus lateralibus albo-notatis; *perianthii tubus* circa 5 cm. longus; *segmenta* oblanceolata, acuta, exteriora conspicue mucronata, 2·5—3 cm. longa, 6—8 mm. lata. *Filamenta* 1—1·6 cm. longa antheraeque 7—8 mm. longae.

Leaves narrower than in var. *framesii*, with a slender petiole 1—3 cm. long, the blade linear-lanceolate or lanceolate, acuminate, usually pungent, 5—15 cm. long, 3—6 mm. wide, densely villous. *Bract* minutely pubescent, acute, acuminate or cuspidate, 2·5—4 cm. long, the lowest often up to 6 cm. long, with a subulate awn 1—2 cm. long. *Flowers* mauve, the lower lateral lobes with white blotches; *perianth tube* about 5 cm. long; *lobes* oblanceolate, acute, 2·5—3 cm. long, 6—8 mm. wide, the outer conspicuously mucronate. *Filaments* 1—1·6 cm. long; anthers 7—8 mm. long.

On mountains in Namaqualand, at about 1,000 to 1,450 m. altitude.

TYPE. *Leipoldt*, N.B.G. 981/39, in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. October—November.

NAMAQUALAND. Kamiesberg: *Leipoldt*, N.B.G. 981/39; *Esterhuysen* 1397. Farm Karas, 5 miles from Leliefontein: *Leipoldt* 3538. Between Pedroskloof and Leliefontein: *Drege* 8401, 8402.

38. **B. flabellifolia** Harv. ex Klatt (Plate 21), Linnaea 35: 380 (1867–68); Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 182 (1892) and Fl. Cap. 6: 110 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895); De Wild., Ic. Horti 5, t. 200 (1904–6).

Corm ovoid or globose, 2—4 cm. diam.; tunics matted, of fairly coarse brown fibres, with a neck 5—9 cm. long. *Stem* very short, not more than 1—2 cm. long above ground. *Leaves* 5—7, spreading fan-wise or suberect, cuneate, the apex irregularly serrate or dentate, plicate, pubescent or puberulous, rarely minutely hispidulous or subglabrous, 3—7 cm. long, 0·7—1·4 cm. wide. *Spike* congested at ground level, 5—6-flowered. *Bract* lanceolate, acuminate, 2·5—5 cm. long, herbaceous, villous or

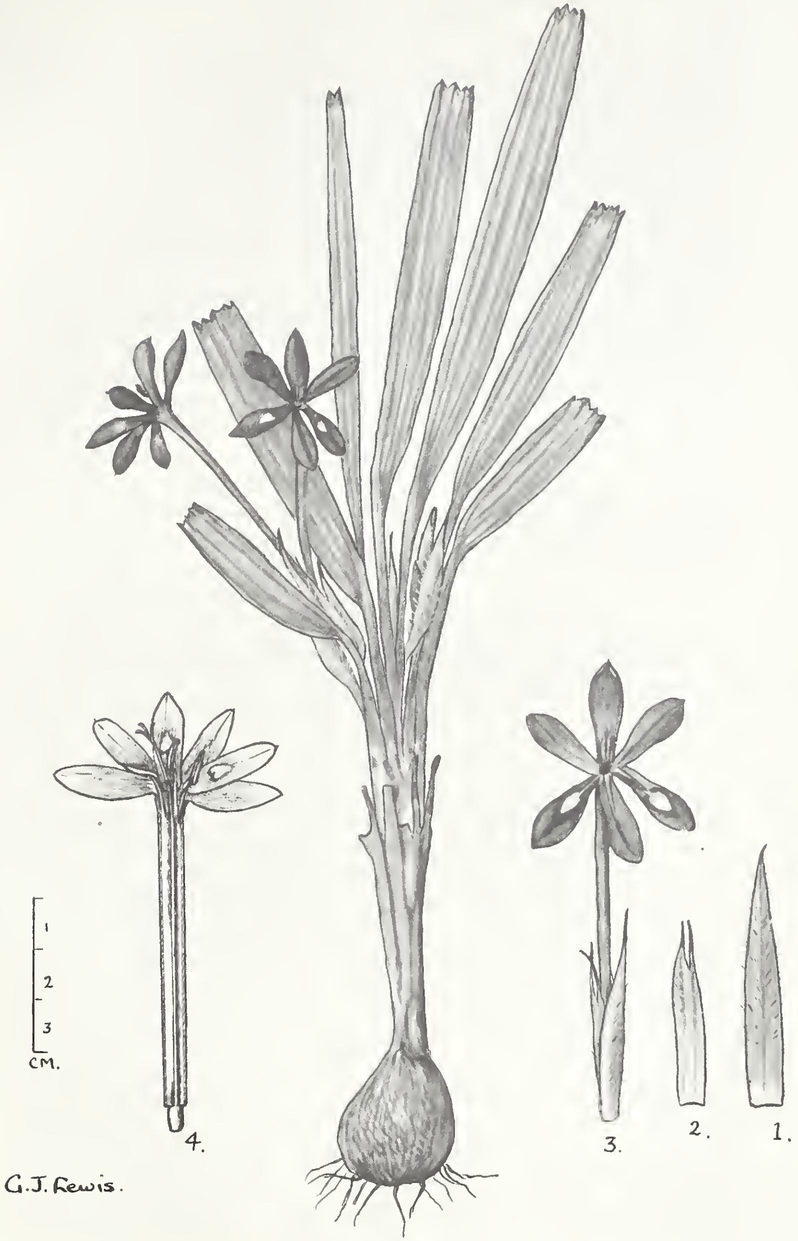

PLATE 21.
B. flabellifolia Harv. ex Klatt. (Slightly reduced.) Plant from foot of Hantam Mountains, grown at South African Museum, Cape Town.
1. Bract. 2. Bracteoles. 3. Flower. 4. Flower laid open.

pubescent, occasionally hispidulous; *bracteoles* 1 cm. or more shorter than the bract, united with free setaceous tips, the margins hyaline. *Flowers* zygomorphic, purple, the lower lateral lobes with a small white spathulate mark near the middle; *perianth tube* straight, slender, cylindrical, 4—6·5 cm. long; *lobes* subequal, patent, more or less oblanceolate or elliptic-oblanceolate, acute or subacute, 1·6—2·3 cm. long, 5—7 mm. wide, the outer usually mucronulate. *Stamens* suberect, very shortly exserted from the perianth tube; filaments 6—7 mm. long; anthers 6 mm. long. *Ovary* oblong, 4 mm. long, glabrous; style reaching to middle of anthers or above the top, with linear-spathulate conduplicate branches 2—3 mm. long.

Gravel soil on hills and lower mountain slopes in the Laingsburg, Calvinia and Upington districts and Namaqualand.

TYPE. *Whitehead*, in Kew Herbarium.

Flowering period. June—July.

NAMAQUALAND. Without precise locality: *Whitehead.*

UPINGTON. *Orpen* (21135 in S. Af. Mus.).

CALVINIA. Hantam Mountains: *Marloth* 12792, 10439. Foot of Hantam Mountains: *Lewis* 1885; *Stokoe* (59871 in S. Af. Mus.). Akkerdam: *Acocks* 18506. Calvinia, in vlei: *Schmidt* 340.

LAINGSBURG. Whitehill: *Compton* 13389.

WITHOUT LOCALITY. *Ross-Frames* (19218 in Herb. Bol.).

The subequal perianth lobes not arising obliquely from the tube are unusual in this section but the affinity of this species is with *B. framesii* and *B. sambucina*, both of which belong here.

39. **B. pauciflora** Lewis sp. nov. (Plate 22).

Cormus ovoideus vel globosus, 1·8—2·5 cm. diam., tunicis concretis e fibris brunneis in collo denso circa 9 cm. longo productis, compositis. *Caulis* simplex, subdecumbens, petiolis opertus, 2—7 cm. longus. *Folia* 4—6, disticha, petiolis planis, conduplicatis, glabris, supra terram per 2—5 cm. productis; lamina oblique oblonga vel oblongo-lanceolata, subacuta vel acuta, 1—10 cm. longa, plerumque 1·3—1·8 cm. lata, nervis puberulis, ad basin solum leviter plicata. *Spica* brevis, secunda, arcte 2—4-flora. *Bractea* lanceolata, acuta vel acuminata, 3·5—5·5 cm. longa, ad basin glabra superne exigue pubescens; *bracteolae* bracteae similes, coalitae apicibus liberis acuminatis, firme bicarinatae. *Flores* irregulares, odorati, lilacini, segmentis lateralibus inferioribus pro parte majore luteis; *perianthii tubus* gracilis, 3·5—4·5 cm. longus, apicem versus infundibuliformis; *segmenta* inaequalia, oblique orta, oblanceolata, obtusa vel acuta, 3 superiora 3—5 cm. longa, 0·8—1·5 cm. lata, dorsale quam lateralia leviter longius; segmenta 3 inferiora 2·4—4 cm. longa, 0·6—1 cm. lata, infimum quam lateralia 3—4 mm. longius. *Stamina* subarcuata filamentis circa 1·5 cm. longis antherisque 8 mm. longis. *Ovarium* oblongum, 6 mm. longum, glabrum, stipite brevissimo; stylus prope ad apicem antherarum attingens, ramis spathulatis vel oblanceolatis conduplicatis 4 mm. longis.

Corm ovoid or globose, 1·8—2·5 cm. diam.; tunics matted, of brown fibres, with a thick neck about 9 cm. long. *Stem* slightly decumbent, enclosed within the petioles, 2—7 cm. long, simple. *Leaves* 4—6, distichous with flattened conduplicate glabrous petioles extending 2—5 cm. above ground, the blade obliquely oblong or oblong-lanceolate, subacute or acute, 1—10 cm. long, usually 1·3—1·8 cm. wide, puberulous on the veins, slightly plicate at the base only. *Spike* short, compact, secund, 2—4-flowered. *Bract* lanceolate, acute or acuminate, 3·5—5·5 cm. long, glabrous at the base, sparsely pubescent above; *bracteoles* united with free acuminate tips, strongly bicarinate. *Flowers* zygomorphic, fragrant, violet-coloured, the lower lateral lobes bright yellow with lilac margins, the lowest lobe with a red subulate mark in the lower half; *perianth tube* slender, 3·5—4·5 cm. long, narrowly cylindrical, the upper third or quarter infundibuliform; *lobes* unequal, arising obliquely, oblanceolate, obtuse or acute, the 3 upper 3—5 cm. long, 0·8—1·5 cm. wide, the dorsal slightly longer than the 2 lateral; 3 lower lobes 2·4—4 cm. long, 0·6—1 cm. wide, the lowest 3—5 mm. longer than the 2 lateral. *Stamens* subarcuate; filaments about 1·5 cm. long; anthers 8 mm. long. *Ovary* oblong, 6 mm. long, glabrous, shortly stipitate; style reaching nearly to top of anthers, with spathulate or oblanceolate conduplicate branches 4 mm. long.

In red sandy soil on flats at about 850 to 1,000 m. altitude in the Calvinia Division.

TYPE. *Lewis* 2750 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. June.

CALVINIA. Near Menzieskraal, between Botterkloof and Calvinia: *Lewis* 2750. Eight miles N. of Nieuwoudtville: *Salter* 7319.

40. **B. truncata** Lewis sp. nov. (Plate 23).

Cormus ovoideus vel globosus, 1·8—2·5 cm. diam., tunicis e fibris brunneis vel rubido-brunneis sat tenuibus vel robustis in collo denso 8—11 cm. longo productis, compositis. *Caulis* omnino subterraneus. *Folia* 5—7, disticha, 1·5—4 cm. longa, 0·7—1·4 cm. lata, cuneata, apice truncata inaequaliter dentata vel serrata, glabra vel hispidula. *Spica* compacta, 3—pluriflora. *Bractea* oblongo-lanceolata vel oblonga, acuta, plerumque apiculata, 1·5—3 cm. longa, herbacea, plerumque mollis parte dimidia inferiore submembranacea, glabra vel hispidula; *bracteolae* bracteae aequales vel leviter longiores, coalitae apicibus liberis apiculatis

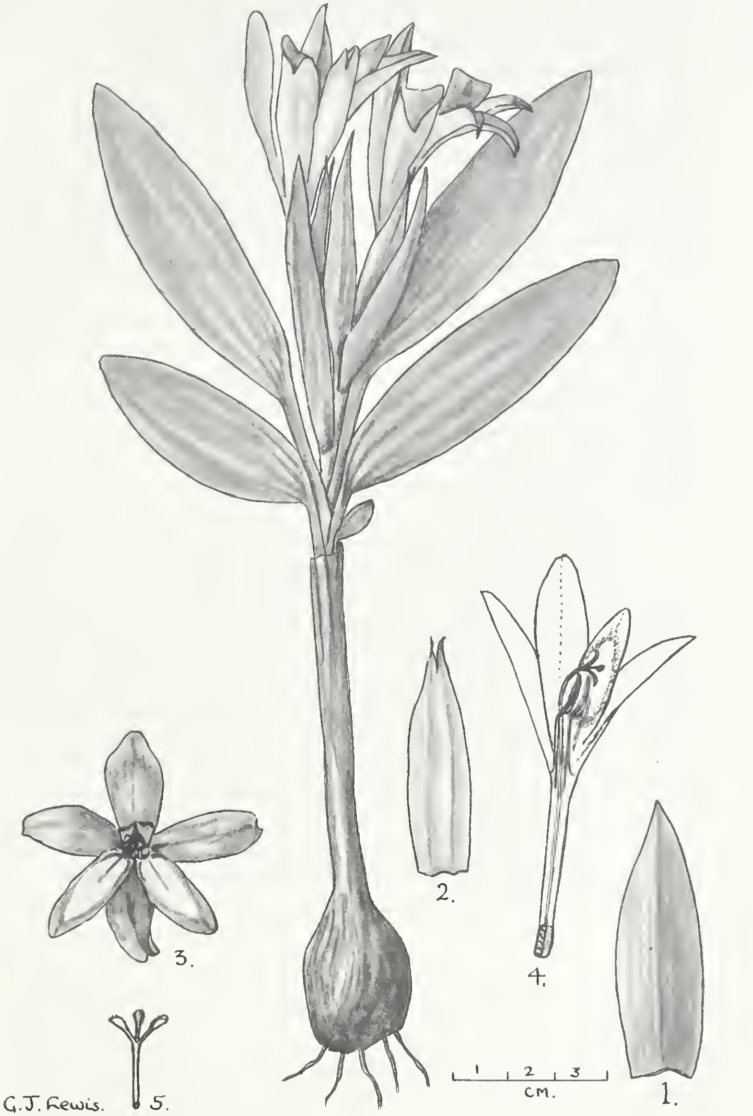

Plate 22.

B. pauciflora Lewis. (Slightly reduced.) Plant from between Botterkloof and Calvinia, grown at South African Museum, Cape Town.

1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower. 5. Top of style and style branches × 2.

vel setaceis, prope omnino membranaccae. *Flores* irregulares, late campanulati, lilacini vel purpureo-lilacini tubo luteo et parte dimidia inferiore segmentorum lateralium inferiorum pallide lutea; *perianthii tubus* rectus vel leviter curvatus, 3·2—3·6 cm. longus, inferne cylindricus ad fauces ampliatus et infundibuliformis; *segmenta* leviter oblique orta, oblongo-oblanceolata, 0·7—1 cm. lata, obtusa, exteriora mucronulata, 3 superiora 2·7—3·3 cm. longa, dorsale quam lateralia leviter longius et latius, 3 inferiora 2·5—2·7 cm. longa. *Stamina* arcuata filamentis 1·5—1·8 cm. longis antherisque 6—8 mm. longis. *Ovarium* oblongum, 4—6 mm. longum, glabrum; stylus ad medium vel apicem antherarum attingens, ramis anguste spathulatis vel lineari-oblanceolatis conduplicatis 5 mm. longis.

Corm ovoid or globose, 1·8—2·5 cm. diam.; tunics of fairly fine to coarse brown or reddish brown fibres, with a thick matted neck 8—11 cm. long. *Stem* entirely subterranean. *Leaves* 5—7, distichous, 1·5—4 cm. long, 0·7—1·4 cm. wide, cuneate, the truncate apex irregularly dentate or serrate, glabrous or hispidulous. *Spike* congested at ground level, 3—several-flowered. *Bract* oblong-lanceolate or oblong, acute, usually apiculate, 1·5—3 cm. long, herbaceous, usually soft with the lower half submembranous, glabrous or hispidulous; *bracteoles* united with free apiculate or setaceous-apiculate tips, almost entirely membranous, as long as the bract or slightly longer. *Flowers* zygomorphic, widely campanulate, pale to deep mauve, the perianth tube yellow or orange-yellow and the lower half of the lower lateral lobes pale yellow; *perianth tube* straight or slightly curved, 3·2—3·6 cm. long, cylindrical below, towards the throat expanded and infundibuliform; *lobes* arising slightly obliquely, oblong-oblanceolate, obtuse, 0·7—1 cm. wide, the outer mucronulate, the 3 upper 2·7—3·3 cm. long, the dorsal slightly longer and wider than the 2 lateral, the 3 lower 2·5—2·7 cm. long. *Stamens* arcuate; filaments 1·5—1·8 cm. long; anthers 6—8 mm. long. *Ovary* oblong, 4—6 mm. long, glabrous; style reaching to middle or top of anthers, with narrowly spathulate or linear-oblanceolate conduplicate branches 5 mm. long.

In reddish soil among hills in Namaqualand and the Calvinia Division.

TYPE. *Lewis* 2203 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. July—August.

NAMAQUALAND. Steinkopf to Kosies: *Verdoorn* 1859. Two miles E. of Springbok: *Lewis* 2203; *Barker* 6242. O'okiep: *Wikner* (62774 in S. Af. Mus.). Seven miles N. of Concordia: *Barker* 6305. Between Garies and O'okiep: *Marloth* 6739. Mierenskasteel: *Drege* 2626.

CALVINIA. Papelfontein, Onderbokkeveld: *Schlechter* 10892. Lokenberg: *Compton* 11504.

B. truncata bears a close superficial resemblance to *B. pubescens* (=*B. cuneifolia* Bkr.) and *B. flabellifolia* on account of the similarity of the leaves, and in some herbaria the specimens collected by Drege and Schlechter have been identified as either one or the other of these species. The flowers, however, are quite unlike those of either species, those of *B. pubescens* having a curved perianth tube with a distinct geniculate bend near the throat and the lobes very unequal, the upper lateral united with the 3 lower in a lip and the lower lobes considerably shorter than the dorsal lobe, while in *B. flabellifolia* the perianth tube is cylindrical to the throat, the lobes are subequal and comparatively shorter and narrower than in *B. truncata* and the stamens are very shortly exserted from the perianth tube, with filaments not more than 7 mm. long. The bracts are somewhat variable and in some of the specimens cited above they are firmer than in the type.

In the Berlin-Dahlem Herbarium *Drege* 2626 (collected on the same date and in the same area as *Drege* 2627, the type of *B. cuneifolia* Bkr.) is named *B. flabellifolia* Harv. MSS. by Klatt, but it is a form of *B. truncata* in which the stem extends very shortly above ground instead of being entirely subterranean as is usual in this species.

41. **B. attenuata** Lewis sp. nov. (Plate 24).

Cormus ovoideus circa 2 cm. diam., tunicis e fibris rubido-brunneis in collo 9—12 cm. longo productis, compositis. *Caulis* brevis, decumbens, hispidulus, 3—5 cm. longus, simplex vel ramis 1—2 brevissimis. *Folia* 5—7, declinata vel suberecta, lineari-lanceolata, acuminata, plicata, villosa vel pubescentia, 3·5—9 cm. longa, 2·5—5 mm. lata. *Spica* secunda arcte 4—9-flora. *Bractea* lanceolata, acuminata, herbacea, velutina, 2·8—4 cm. longa; *bracteolae* bracteae similes sed leviter breviores, coalitae, bicarinatae, bicuspidatae. *Flores* irregulares, plus minusve bilabiati, odorati, caerulei segmentis lateralibus inferioribus supra basin albo- et luteo-notatis; *perianthii tubus* 3·2—4·5 cm. longus, filiformi-cylindricus, 6—10 mm. infra fauces leviter curvatus et superne anguste infundibuliformis; *segmenta* oblique orta, anguste elliptica vel lanceolata, acuta vel subacuta, 2·5—3·8 cm. longa, dorsale quam 3 inferiora 5 mm. longius, exteriora apiculata, 4—5 mm. lata, et interiora 6—8 mm. lata. *Stamina* arcuata filamentis 1·5 cm. longis antherisque 5—6 mm. longis. *Ovarium* subglobosum, 3—4 mm. longum, glabrum; stylus plerumque ad apicem antherarum vel supra attingens, ramis gracilibus oblanceolatis conduplicatis 4—5 mm. longis.

Corm ovoid, about 2 cm. diam.; tunics of reddish brown fibres, with a neck 9—12 cm. long. *Stem* short, decumbent, hispidulous, 3—5 cm. long, simple or with 1—2 very short branches. *Leaves* 5—7, declinate or

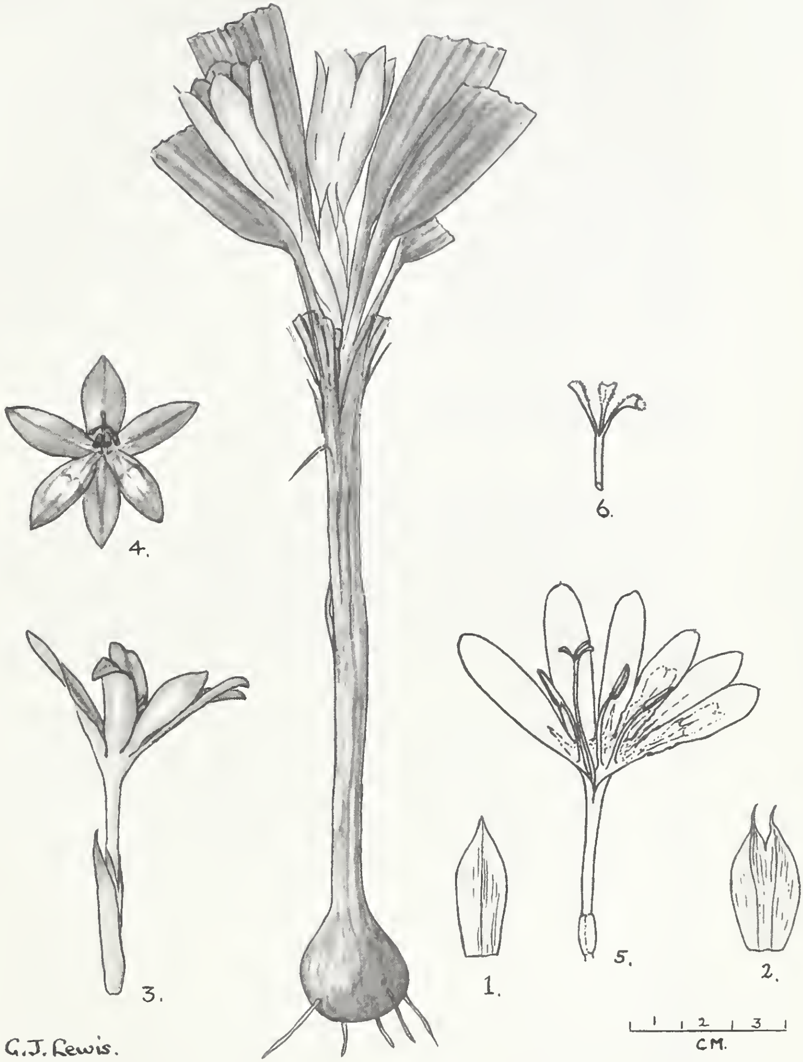

PLATE 23.
B. truncata Lewis. (Slightly reduced.) Plant from O'okiep, Namaqualand, grown at South African Museum, Cape Town.
1. Bract. 2. Bracteoles. 3. Flower, side view. 4. Flower, front view. 5. Flower laid open. 6. Top of style and style branches × 2.

suberect, linear-lanceolate or lanceolate, acuminate, plicate, villous or pubescent, 3·5—9 cm. long, 2·5—5 mm. wide. *Spike* secund, closely 4—9-flowered. *Bract* lanceolate, acuminate, herbaceous, velutinous, 2·8—4 cm. long, 8 mm. wide; *bracteoles* similar to the bract but slightly shorter, united, bicarinate and bicuspidate. *Flowers* zygomorphic, more or less bilabiate, blue with large pale yellow and white spathulate marks above the base on the lower lateral lobes, fragrant; *perianth tube* 3·2—4·5 cm. long, with a slight curve 6—10 mm. below the throat, filiform-cylindrical below and narrowly infundibuliform above the curve; *lobes* arising slightly obliquely, narrow-elliptic or lanceolate, acute or subacute, 2·5—3·8 cm. long, the dorsal 5 mm. longer than the 3 lower, the outer apiculate, 4—5 mm. wide, the inner 6—8 mm. wide. *Stamens* arcuate; filaments 1·5 cm. long; anthers 5—6 mm. long. *Ovary* subglobose, 3—4 mm. long, glabrous; style reaching to top of anthers or above, with slender oblanceolate conduplicate branches 4—5 mm. long.

In stony ground at the foot of mountains and on hills in Namaqualand.

TYPE. *Lewis* 4414 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August—September.

NAMAQUALAND. Foot of Kamiesberg, near Kamieskroon: *Lewis* 4414; *Barker* 1128; *Salter*, N.B.G. 1720/31. Upper part of Bowesdorp Valley: *Pillans*. Draaiklip: *Pearson* 6837. Seven miles S. of Kamieskroon: *Salter* 3810. Between Garies and Bitterfontein: *Leipoldt* 3878.

B. attenuata is distinguished from *B. curviscapa*, which it somewhat resembles in the dried state only, by the much more slender perianth tube and longer and more tapering lobes.

42. **B. longicollis** Dinter in Fedde Rep. 29: 253 (1931).

Corm subglobose, about 3 cm. diam.; tunics matted, of fine closely reticulate light brown fibres, with a neck up to 23 cm. long. *Stem* very short, more or less declinate, obtusely angled, glabrous, simple or with 1 branch. *Leaves* erect, linear-lanceolate, acuminate, about 6—10 cm. long, 2—4 mm. wide, with a long recurved and usually spirally twisted point, flat or firmly plicate, pilose on the margins at the base and above very shortly pubescent. *Spike* short, distichous or secund, compactly 3—5-flowered. *Bract* ovate, obtuse, 1·8—2 cm. long, herbaceous with membranous margins, glabrous, the apex reddish brown, punctate; *bracteoles* united with very short free setaceous-cuspidate tips, otherwise like the bract but very slightly longer. *Flowers* zygomorphic, blue-violet; *perianth tube* 2·5—2·8 cm. long, narrow below, infundibuliform above; *lobes* arising slightly obliquely, the dorsal slightly longer than the 3 lower, all lanceolate-oblong, 1·5—1·8 cm. long, 5—6 mm. wide, the outer mucronulate. *Stamens* arcuate, reaching to middle of upper perianth lobes; anthers 5 mm. long. *Ovary* globose, 5—7 mm. long, glabrous; style reaching to base of anthers, with linear-oblanceolate conduplicate branches 3—4 mm. long.

Coastal desert in South West Africa, among phonolith boulders mixed with coarse sand.

TYPE. *Dinter* 4007 in the Berlin-Dahlem Herbarium.

Flowering period. September.

SOUTH WEST AFRICA. On Klinghardt Mountains: *Dinter* 4007.

43. **B. ecklonii** Klatt Abh. Naturf. Ges. Halle 12: 348 (1882) and Erganz. 14 (1882); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895). *B. tubiflora* Eckl. Top. Verz. 32 (1827); non Ker (1805). *B. velutina* Schltr. in Engl. Bot. Jahrb. 27: 100 (1900). *B. fastigiata* L. Bolus, S.A. Gard. & Country Life 17: 375 (1927).

Corm ovoid, 2—2·5 cm. diam.; tunics of matted fine brown or reddish brown fibres, with a neck 12—15 cm. long. *Stem* erect, 8—20 cm. high, pubescent, almost entirely enclosed within the leaves, usually 1—4-branched, the branches short, erect or occasionally suberect or patent. *Leaves* 7—9, distichous, suberect, ensiform or lanceolate, acuminate or acute, 5—30 cm. long, 0·8—1·8 cm. wide or occasionally up to 2·5 cm., somewhat laxly plicate at the base only, pubescent, often velutinous. *Spike* distichous, closely 4 to many-flowered. *Bract* lanceolate, acuminate, 1·4—4 cm. long, carinate, herbaceous, pubescent, the apex usually sphacelate; *bracteoles* free or united at the base, linear-lanceolate, acuminate, often setose, with narrow hyaline margins, as long as or slightly shorter than the bract. *Flowers* bilabiate, blue, mauve-blue or violet, with small or large white or pale yellow patches on the lower lateral lobes; *perianth tube* 3·5—4·5 cm. long, slender, geniculate just below the throat and slightly widened from there upwards; *lobes* unguiculate, very unequal, obtuse or subacute, the outer oblanceolate, mucronate and ciliate on the medial vein outside, near the apex only or sometimes to the base, the inner lobes more or less spathulate; dorsal lobe free, recurved, 2—3 cm. long, 6—8 mm. wide near the apex; upper lateral lobes shortly united with the 3 lower in a lip, somewhat falcate, 1·5—2·3 cm. long, 2·5—5 mm. wide; 3 lower lobes with the claws united for 2—5 mm., rarely free, the blades 1·2—1·8 cm. long, the lateral 5—6 mm. wide and the lowest 3—4 mm. wide. *Stamens* subarcuate; filaments 1·3—1·5 cm. long; anthers 5—6 mm. long. *Ovary* rotund, glabrous at the base, villous above; style reaching shortly above base or top of anthers, with conduplicate oblanceolate or spathulate branches 4 mm. long.

In rock crevices or among rocks on flats and lower mountain slopes in the Olifants River Valley, from near Citrusdal to Vanrhynsdorp.

Lectotype. *Ecklon* and *Zeyher* 133 in the Delessert Herbarium, Geneva.

Flowering period. August—September.

Vanrhynsdorp. Klaver: *L. Bolus* and *Lewis*, N.B.G. 1849/32; *Lewis* 1408; *Stokoe* and *Davis* (59869 in S. Af. Mus.). Vanrhynsdorp: *Andreae* 546. Giftberg, near Windhoek: *Schlechter* 8364 (type of *B. velutina*—isotypes in Kew, Brit. Mus., Nat. Hist. Mus., Paris, Herb. Delessert, Zürich Un. Herb., Bol. Herb. and Nat. Herb., Pretoria).

Clanwilliam. Near Clanwilliam: *Steyn* 510; *Compton* 22770. Six miles N. of Clanwilliam: *Lewis*. Ten miles N. of Clanwilliam: *Leighton* 1097. Nardouw road: *Barker* 3623, 7436; *Compton* 17146. Ten miles S. of Clanwilliam: *Compton* 24138. Twenty-three miles N. of Citrusdal: *Barker* 6601. Fifteen miles N. of Citrusdal: *Lewis* 1365. Between Citrusdal and Clanwilliam: *Barker* 3616. Near Citrusdal: *Barker* 3768; *Compton* 17318. Modderfontein: *Gillett* 3674. Elands Kloof road, near Citrusdal: *Leighton* 1251; *Lewis* 1366; *Stokoe* (55675 b in S. Af. Mus.). Greys Pass: *Barker* 5596; *Salter* 2724.

Without Locality. *Ecklon* and *Zeyher* 133; *Van Zyl* (17823 in Herb. Bol., type of *B. fastigiata* L. Bolus).

The species is variable, with fairly distinct forms merging into one another. In the same locality some plants have been found with short bracts and others with long. The form which occurs near Citrusdal and Elands Kloof has comparatively shorter, broader and more sparsely pubescent leaves, and the lower perianth lobes slightly broader than usual. In this area the corms are deeply embedded in sand among rocks, not actually in fissures in the rocks as are the more elongated plants, with narrower and more erect leaves, found on slopes above the Olifants River from Citrusdal to Klaver. Towards the northern limits the pubescence on the leaves is shorter and denser, soft and velvety to the touch.

B. fastigiata was described from plants grown in a garden and said to have come from between Oudtshoorn and George, but there must have been some confusion about this as it is undoubtedly the same as *B. ecklonii* and the species does not occur outside the localities recorded above.

B. ecklonii Klatt var. **latifolia** (L. Bolus) Lewis stat. nov. *B. latifolia* L. Bolus, S.A. Gard. & Country Life 17: 375 (1927).

Leaves ensiform, acute, arranged fan-wise, more or less plicate, up to 10 cm. long, 1—2 cm. wide, the petiole not extending much above ground and not or only shortly enclosing the stem. *Stem* erect, somewhat flexuose, simple or branched, the terminal spike and branches if present sometimes recurved, if recurved then the spike secund. *Bract* usually narrow-oblong, more or less truncate, the apex brown and scariose, apiculate, sometimes emarginate, occasionally lanceolate and acute, 1—3 cm. long; *bracteoles* free, acuminate, 1—2 cm. long. *Flowers* lilac to dark blue, slightly smaller than in var. *ecklonii; perianth tube* 2·6—4 cm. long; *lobes* spathulate, obtuse, up to 2 cm. long, 3—4 mm. wide. *Style* branches with more rounded and crenulate stigmas.

In reddish soil at the foot of Piketberg Mountain.

TYPE. *Van Zyl*, N.B.G. 625/27, in the Bolus Herbarium.

Flowering period. August—September.

PIKETBERG. *Van Zyl*, N.B.G. 625/27. Foot of Piketberg Mountain: *Schlechter* 5214.

The leaves in this variety are not wider than in the var. *ecklonii.* Plants collected near the roadside about 6 miles south of Piketberg, *L. Bolus* and *Lewis*, N.B.G. 1819/32, are probably hybrids between the var. *latifolia* and a form of *B. mucronata* which used to be fairly common in that area.

44. **B. dregei** Baker, Journ. Bot. (1876) 336, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 181 (1892) and Fl. Cap. 6: 109 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895).

Corm ovoid-globose, 3—4 cm. diam.; tunics matted, of coarse reddish brown fibres, with a neck 9 cm. or more long. *Stem* erect, glabrous, angled, from 3 or 4 cm. up to 15 cm. high, usually with 3 or 4 short erect branches. *Leaves* 5—7, erect or suberect, ensiform, acuminate, pungent, glabrous, plicate or subplicate, with thick stramineous veins and margins, 12—30 cm. long, 1·2—2·5 cm. wide (occasionally to 3 cm.). *Spike* secund or distichous, several-flowered, usually compact with closely imbricate bracts but occasionally laxer with internodes 1—1·5 cm. long. *Bract* lanceolate, acuminate, herbaceous, often brown at time of flowering, 3·5—6 cm. long, firm, closely striate, glabrous or hispidulous, conduplicate and carinate; *bracteoles* almost entirely united, 5 mm. or more shorter than the bract. *Flowers* zygomorphic, deep purple-blue; *perianth tube* slender, cylindrical, 5—6·5 cm. long, dilated into a narrow funnel and slightly curved below the throat; *lobes* oblong, oblong-spathulate or narrow-oblong, obtuse or acute, 1·8—2·8 cm. long, 6—9 mm. wide, subequal or the 3 upper slightly longer than the 3 lower, the outer only or all mucronate. *Stamens* reaching above the middle of the upper lobes; anthers 8 mm. long. *Ovary* turbinate, 5 mm. long, glabrous; style reaching to middle of anthers or much above them, with oblanceolate conduplicate branches 4—5 mm. long.

In rock crevices on hills and mountain slopes in Namaqualand, at altitudes from 350 to 1,460 m.

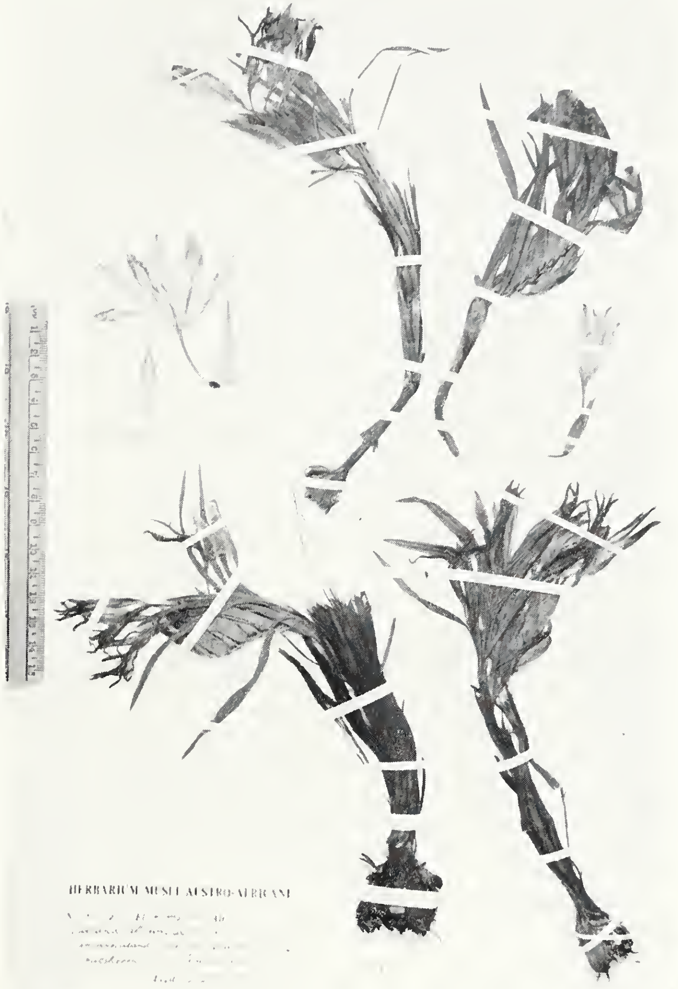

PLATE 24.
B. attenuata Lewis. Type sheet, in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

TYPE. *Drege* 2628 in Kew Herbarium.

Flowering period. August—September.

NAMAQUALAND. Uitkomst: *Drege* 2628. Kamieskroon: *Salter* 1493; *L. Bolus; Thorne* (48855 in S. Af. Mus.); *Compton* 5413. Kamiesberg: *Hutchinson* 882; *Stokoe* in Herb. Marloth 13721. Bowesdorp: *Stokoe* (55602 in S. Af. Mus.). Brackdam: *Lewis* 1391; *Barker* 3661. Droedap: *Barker* 1131; *Esterhuysen* 5901. Leliefontein: *Rodin* 1444. Near Leliefontein: *Leipoldt* 3533; *Acocks* 16472. Near Mesklip: *Leighton* 1154.

The rigidly erect pungent leaves, with stramineous veins, distinguish this from all species so far described. *Pearson* 5773, from near the summit and western slopes of the Kamiesberg Sneeuwkop, about 3,000 to 5,000 feet, has the same type of leaf but smaller flowers with shorter and narrower perianth lobes, and may be a variety or possibly a separate species. In the South African Museum Herbarium and Bolus Herbarium there are incomplete specimens, with no record of the colour of the flowers which appear to have been grazed and are not in a fit condition to dissect. The flowering time is December. In the Compton Herbarium there is a single incomplete specimen, *Leipoldt*, N.B.G. 170/40, from Gariep, which has white flowers with red markings, much smaller than those of *B. dregei*, and one stamen considerably longer than the others. It might perhaps be the same as *Pearson* 5773 but until more material is available it is not possible to draw up a description or decide whether this is a separate species.

45. **B. curviscapa** Lewis sp. nov. (Plate 25).

Cormus subglobosus, 2—2·5 cm. diam., tunicis concretis e fibris rubido-brunneis in collo denso 6—10 cm. longo productis, compositis. *Caulis* brevissimus, decumbens, hispidulus, simplex vel ramis 1—2 brevissimis. *Folia* 5—7, decumbentia, lanceolata, acuta, 3·5—7 cm. longa, 0·5—1 cm. lata, plicata, velutina. *Spica* secunda, compacta, multiflora. *Bractea* lanceolata, 2·5—3·5 cm. longa, 0·8—1 cm. lata, herbacea, hispidula, apice scariosa, ferruginosa; *bracteolae* bracteae similes sed coalitae, bicarinatae et breviter bicuspidatae. *Flores* bilabiati, miniano-rubentes segmentis lateralibus inferioribus medium versus albo-maculatis; *perianthii tubus* 3·6—4·3 cm. longus, cylindricus, prope fauces geniculatus et superne infundibuliformis; *segmenta* oblongo-spathulata, 5—8 mm. lata, exteriora quam interiora leviter angustiora, obtusa, exteriora solum vel omnia breviter apiculata, 3 superiora circa 2·3 cm. longa, dorsale liberum, 2 lateralia cum 3 inferioribus in labio breviter coalita; segmenta 3 inferiora 1·7—1·9 cm. longa. *Stamina* subarcuata filamentis 1·2—1·4 cm. longis antherisque 4—6 mm. longis ad medium segmenti dorsali attingentibus. *Ovarium* rotundum, 3—4 mm. longum, glabrum; stylus ad medium antherarum attingens, ramis oblanceolatis conduplicatis 4 mm. longis.

Corm subglobose, 2—2·5 cm. diam.; tunics matted, of reddish brown fibres, with a thick neck 6—10 cm. long. *Stem* very short, decumbent, hispidulous, simple or with 1—2 very short branches. *Leaves* 5—7, decumbent, lanceolate, acute, 3·5—7 cm. long, 0·5—1 cm. wide, plicate, velutinous. *Spike* secund, densely several-flowered. *Bract* lanceolate, 2·5—3·5 cm. long, 0·8—1 cm. wide, herbaceous, hispidulous, the apex scariose and ferruginous; *bracteoles* united, bicarinate and bicuspidate, similar to the bract. *Flowers* bilabiate, magenta or wine-coloured, the lower lateral lobes with a white spathulate mark near the middle; *perianth tube* 3·6—4·3 cm. long, cylindrical with a geniculate bend shortly below the throat and infundibuliform above; *lobes* oblong-spathulate, 5—8 mm. wide, the outer slightly narrower than the inner, all obtuse, the outer only or sometimes all very shortly apiculate, the 3 upper about 2·3 cm. long, the dorsal free and the 2 lateral shortly united with the 3 lower in a lip; 3 lower lobes 1·7—1·9 cm. long. *Stamens* subarcuate; filaments 1·2—1·4 cm. long; anthers 4—6 mm. long, reaching to middle of dorsal lobe. *Ovary* rotund, 3—4 mm. long, glabrous; style reaching to middle of anthers, with oblanceolate conduplicate branches 4 mm. long.

In sandy soil on flats and low hill slopes in Namaqualand.

TYPE. *Barker* 7431 in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August—September.

NAMAQUALAND. Near Klipfontein: *Bolus* 6580; *Compton* 5412; *Herre* (Stell. Un. Gard. 3230). Between Koperberg, Silverfontein and Kaus: *Drege* 8386. Between Uitkomst and Geelbekskraal: *Drege* 2621, 8397. Near O'okiep: *Scully* 26. Nababees: *Barker* 7431. Near Springbok: *Barker* 6702; *L. Bolus* (20150 in Herb. Bol.); *Salter* 3799. Ten miles W. of Springbok: *Barker* 6637. Ten miles S. of Springbok: *Lewis* 2744. Nieuweputs: *Barker* 3703. Spektakel: *Barker* 7429. Blaustasie: *Lewis* 1387. Mesklip: *Lewis* 1388, 4416; *Barker* 3670. Brakdam: *Leighton* 1138. Springbok Flats: *Herre* (Stell. Un. Gard. 3228, 3229); *Vigne*, N.B.G. 2025/29. Groot Vlei: *Leighton* 1217 a; *Compton* 6609; *Lewis* 1386, 4411; *Barker* 3713, 3747.

This is a very variable species but it has not been possible to separate any varieties as the forms merge into each other and may occur together in one locality. The leaves are sometimes much longer than in the type, lanceolate or linear-lanceolate and erect, extending well above the inflorescence, and the pubescence is occasionally slightly longer and less velvety. The flowers vary in colour from magenta to violet or dark mauve-blue and the length of the filaments is variable, the anthers reach-

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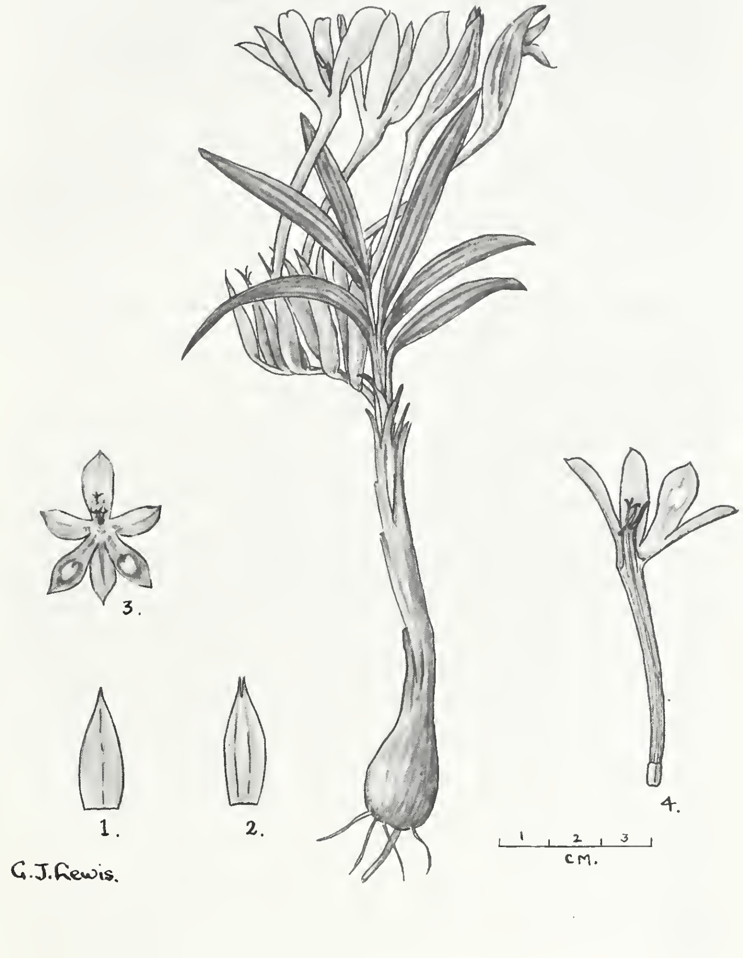

PLATE 25.
B. curviscapa Lewis. (Slightly reduced.) Plant from Mesklip, Namaqualand, grown at South African Museum, Cape Town.
1. Bract. 2. Bracteoles. 3. Flower, front view. 4. Section of flower.

ing to below the middle of the dorsal perianth lobe or sometimes nearly to the top.

In appearance this species closely resembles *B. geniculata* but it differs in having the bracteoles completely united, the perianth lobes and ovary glabrous, and much shorter style branches. From *B. framesii* it is distinguished by having a more distinctly curved or geniculate perianth tube, the lobes slightly shorter, more obtuse and less regular, and shorter anthers.

N. E. Brown cited *Drege* 8386 under *B. Gawleri* (=*B. sambucina*) but subsequently changed his mind and on the sheet in the Kew Herbarium he made the following note: "The pubescence of this is different from that of *B. Gawleri* and I now believe I was wrong in considering it to be the same as that species."

46. **B. geniculata** Lewis sp. nov. (Plate 26). *B. velutina* Schltr. var. *nana* Schltr. in Engl. Bot. Jahrb. 27: 101 (1900).

Cormus ovoideus circa 1·5 cm. diam., tunicis e fibris rubido-brunneis in collo 3·5—7 cm. longo productis, compositis. *Caulis* brevissimus, decumbens, plerumque simplex. *Folia* 5—7, disticha, ad terram adpressa raro suberecta, plicata, velutina, acuta, 2—6 cm. longa, 0·5—1 cm. lata. *Spica* brevis, secunda, dense 4—9-flora. *Bractea* lanceolata vel oblongo-lanceolata, curvata, carinata, conduplicata, acuta, omnino herbacea, velutina, 2·5—3·5 cm. longa, 1—1·4 cm. lata; *bracteolae* acuminatae, ad apicem sphacelatae et marginibus hyalinis, per tertiam partem vel parum ultra medium coalitae, circa 2 cm. longae. *Flores* bilabiati, purpurei, segmentis inferioribus lateralibus medium versus maculis parvis albis sagittatis notatis; *perianthii tubus* 3·5—4·5 cm. longus, gracilis, inferne cylindricus, curvatus, prope fauces geniculatus et superne leviter ampliatus; *segmenta* inaequalia, exteriora oblanceolata, obtusa vel acuta, mucronulata, 4—6 mm. lata, nervo medio extrinsecus ciliato, interiora spathulata vel obovato-oblanceolata, obtusa; segmentum dorsale liberum, 2·3—2·9 cm. longum, 7—9 mm. latum; segmenta 2 lateralia superiora 1·8—2·5 cm. longa, cum 3 inferioribus in labio breviter coalita; segmenta 3 inferiora basi per 2—3 mm. coalita, infimum 1·5—2 cm. longum, lateralia 1·8—2·2 cm. longa, 5—8 mm. lata. *Stamina* subarcuata, filamentis 1·3—1·5 cm. longis antherisque 7 mm. longis. *Ovarium* rotundum 3 mm. longum, supra basin villosum; stylus ad fauces perianthii tubi vel leviter ulterius attingens, ramis filiformibus 1·1—1·3 cm. longis apicem versus leviter ampliatis et conduplicatis.

Corm ovoid, about 1·5 cm. diam.; tunics of reddish brown reticulate fibres, with a neck 3·5—7 cm. long. *Stem* very short, decumbent, usually simple. *Leaves* 5—7, distichous, decumbent or rarely suberect, plicate, velutinous, acute, 2—6 cm. long, 0·5—1 cm. wide. *Spike* short, secund, closely 4—9-flowered. *Bract* lanceolate or oblong-lanceolate, carinate, conduplicate and curved, acute, entirely green and herbaceous, velutinous, 2·5—3·5 cm. long, 1—1·4 cm. wide; *bracteoles* with fairly wide hyaline margins, the apex sphacelate, acuminate, united for one-third to slightly more than half their length, about 2 cm. long. *Flowers* bilabiate, purple with small white sagittate marks near the middle of the lower lateral lobes; *perianth tube* slender, 3·5—4·5 cm. long, geniculate very shortly below the throat and from there slightly widened upwards, cylindrical and curved below; *lobes* unequal, the outer oblanceolate, obtuse or acute, mucronulate, 4—6 mm. wide, externally ciliate on the medial vein, the inner spathulate or obovate-oblanceolate, obtuse; dorsal lobe free, 2·3—2·9 cm. long, 7—9 mm. wide, the 2 upper lateral lobes 1·8—2·5 cm. long, shortly united with the 3 lower in a lip; 3 lower lobes united for 2—3 mm. at the base, the lowest 1·5—2 cm. long, the lateral 1·8—2·2 cm. long, 5—8 mm. wide. *Stamens* subarcuate; filaments 1·3—1·5 cm. long; anthers 7 mm. long. *Ovary* rotund, 3 mm. long, villous above the base; style reaching to the throat of the perianth tube or shortly above, with filiform branches 1·1—1·3 cm. long, slightly widened and conduplicate towards the apex.

In sandy soil on flats and hills in the Clanwilliam Division, east of the Cedarberg, at altitudes of 250 to 600 m.

TYPE. *Schlechter* 8666 in the Bolus Herbarium.

Flowering period. August.

CLANWILLIAM. Hills between Brandewyn and Doornbosch Rivers, about 10—15 miles S. of Doornbosch: *Lewis* 2208; *Barker* 6565. Boontjesrivier: *Schlechter* 8666. Besjiesfontein: *Leipoldt* (20773 in Herb. Bol.).

In appearance the flowers resemble those of *B. ecklonii* and *B. curviscapa* but the style branches are the longest recorded in the genus and these, as well as other characters, serve to distinguish this species. Schlechter placed it as a variety of *B. velutina* (=*B. ecklonii*) but it differs from that species not only in having much longer style branches but also much shorter leaves, the stem very short and decumbent and much wider bracts which are curved and conduplicate.

47. **B. pubescens** (Lam.) Lewis (Plate 27), Ann. S.A. Mus. 40: 131 (1954). *Gladiolus pubescens* Lam. Illustr. 1: 119 (1791). *Babiana cuneifolia* Baker, Journ. Bot. (1876) 335, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 182 (1892) and Fl. Cap. 6: 110 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 198 (1895); Lewis, Fl. Pl. of S. Afr. 18, t. 685 (1938).

Corm ovoid or subglobose, 2·5—3·5 cm. diam.; tunics matted, of coarse somewhat woody fibres, with a neck 10—20 cm. long. *Stem* not

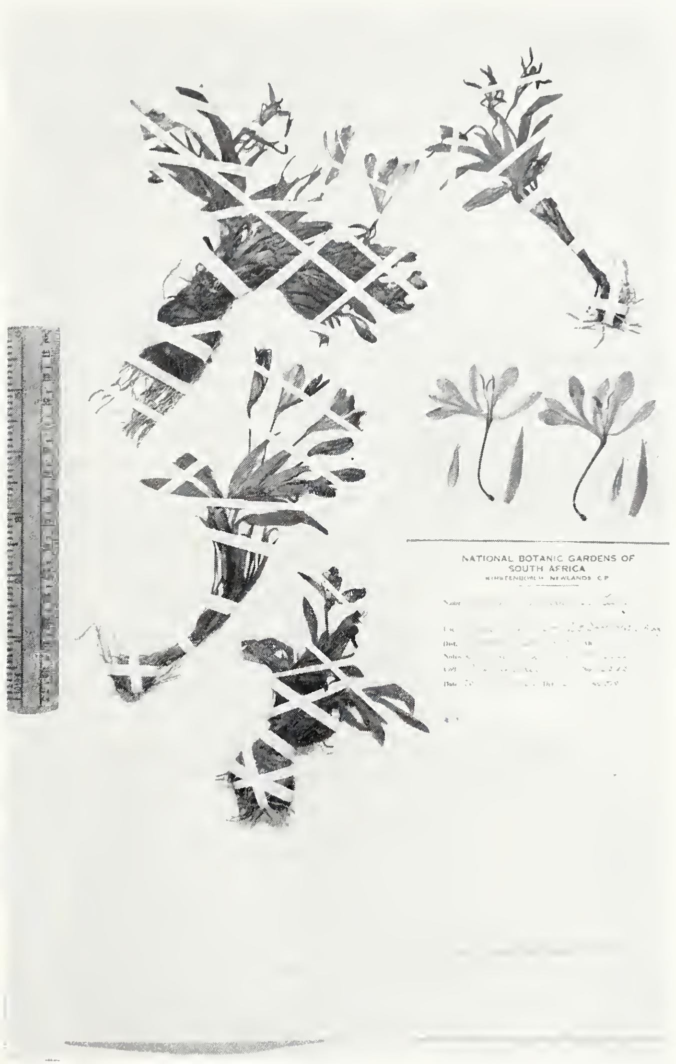

PLATE 26.
B. geniculata Lewis. Specimens collected by Miss Barker in the Clanwilliam Division;
Compton Herbarium.

more than 5 cm. long, subcrect, declinate or decumbent, simple or with 1—2 very short branches. *Leaves* 5—6, cuneate, 3—7 cm. long, 1·2—2·5 cm. wide, slightly plicate, subglabrous, shortly pubescent or velutinous, the truncate apex irregularly dentate or minutely serrate. *Spike* distichous or secund, compact with closely imbricate bracts, 6—10-flowered. *Bract* ovate-lanceolate or oblong, 2—3·8 cm. long, herbaceous, glabrous, hispidulous or velutinous, the apex sphacelate; *bracteoles* united, with free acuminate sphacelate tips and hyaline margins, slightly shorter than the bract. *Flowers* bilabiate, purple, the lower lobes marked with red, the 2 lateral with a white semicircular mark above the red; *perianth tube* curved, about 5 cm. long, cylindrical, geniculate shortly below the throat and above this infundibuliform; *lobes* unequal, oblanceolate or oblong-oblanceolate, obtuse or subacute, minutely cuspidate, 5—7 mm. wide, the outer slightly narrower than the inner; 3 upper lobes about 2 cm. long, the dorsal free, slightly larger than the 2 lateral which are shortly united with the 3 lower in a lip, the 3 lower lobes 1·5—1·7 cm. long. *Stamens* subarcuate; filaments 1·4—1·5 cm. long; anthers 6—7 mm. long. *Ovary* rotund, 4 mm. long, glabrous; style reaching shortly above base of anthers, with conduplicate oblanceolate branches 4 mm. long.

Hills in Namaqualand, in hard gravel soil.

TYPE. *De Vaillant* in Herb. Lamarck, Natural History Museum, Paris.

Flowering period. July—August.

NAMAQUALAND. Mierenskasteel: *Drege* 2627 (type of *B. cuneifolia*, in Kew Herb.). Hillside near Garies: *Lewis* (22162 in Herb. Bol.); *Barker* 6606, 7404. Two miles S. of Nuwerus: *Lewis* 1390.

WITHOUT LOCALITY. *De Vaillant* in Herb. Lamarck.

Schlechter 8248, from Kareebergen in the Vanrhynsdorp Division, is probably this species but the material seen is too poor for correct determination.

The type of *B. cuneifolia* in Kew Herbarium is a poor specimen, with a few badly eaten flowers, but there is an isotype in the Berlin-Dahlem Herbarium in good condition, with more numerous flowers. As in many species, the pubescence is extremely variable, the leaves and bracts in Drege's specimens being minutely pubescent, the former sometimes almost glabrous, whereas in Lamarck's type of *Gladiolus pubescens* they are densely pubescent and velutinous. The specimen of *Drege* 2627 in the Natural History Museum Herbarium in Paris is not *Babiana pubescens* but *B. truncata* Lewis; it is the same as *Drege* 2626, collected at the same place and on the same date, which is *B. truncata*, and it is possible that specimens with these two numbers were confused. On the type sheet of *B. cuneifolia* in Kew Herbarium are mounted some specimens of *B.*

truncata, Schlechter's No. 10892. The differences between these species are discussed under *B. truncata*.

48. **B. hypogea** Burch. Travels 2: 589 (1824); Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 180 (1892) and Fl. Cap. 6: 107 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 199 (1895); Dyer, Fl. Pl. Afr. 25, t. 962 (1946). *Antholyza hypogea* (Burch.) Klatt Erganz. 11 (1882). *Babiana Bainesii* Baker, Journ. Bot. (1876) 335, Journ. Linn. Soc. 16: 165, Handbk. Irid. 180 and Fl. Cap. 6: 107; Dur. & Sch. l.c. 198. *B. Bakeri* Schinz, Bull. Herb. Boiss. Ser. ii, 6: 712 (1906). *B. Schlechteri* Baker, Bull. Herb. Boiss. Ser. ii, 4: 1005 (1904).

Corm ovoid or subglobose, usually 2—3 cm. diam.; tunics thickly matted, reticulate, with a neck 6—20 cm. long. *Stem* entirely subterranean, simple or branched below ground. *Leaves* usually 4—7, erect or suberect, overtopping the flowers, linear or lanceolate tapering to base and apex, 7—20 cm. long, sometimes to 30 cm., 0·3—1 cm. wide, laxly to deeply plicate, glabrous, hispidulous, villous or pilose on the ribs. *Inflorescence* congested, of 1 or more very short compact spikes with 2—8 flowers arising below ground. *Bract* lanceolate, acuminate, 3·5—8 cm. long, the base or lower half usually hyaline, green above and the apex scariose and ferruginous; *bracteoles* similar to the bract but slightly shorter, united with free acuminate tips. *Flowers* bilabiate, varying from nearly white to pale or dark blue, bluish mauve or pale mauve, usually with a white or yellow area near the middle on the lower lateral lobes, fragrant; *perianth tube* narrowly cylindrical, slightly expanded to the throat and usually infundibuliform, 3·5—5·5 cm. long; *lobes* more or less oblanceolate, obtuse or acute, the outer only or sometimes all mucronate, 2·5—6 cm. long, 0·6—1·2 cm. wide (sometimes to 1·5 cm.), the 3 upper slightly longer than the 3 lower, the dorsal free and upper lateral very shortly united with the 3 lower in a lip. *Stamens* subarcuate; filaments 1—1·5 cm. long; anthers 0·8—1 cm. long. *Ovary* oblong, 0·8—1·2 cm. long, shortly stipitate, glabrous; style usually reaching to top of anthers or above, with oblanceolate conduplicate branches 5—6 mm. long.

Open grassy places in red sandy soil in summer-rainfall areas, extending from South West Africa across the northern Cape Province to the Transvaal and Southern Rhodesia. The corms are said to be eaten by Bushmen.

TYPE. *Burchell* 2241 in Kew Herbarium.

Flowering period. Usually April—August, sometimes March, September or November, depending on climatic conditions.

SOUTH WEST AFRICA. Rehoboth: *Fleck* 366. Gobabis: *Fourie* (22316 in Herb. Bol.). Otavi: *Wall* in Herb. Marloth 5379. Near Groot-

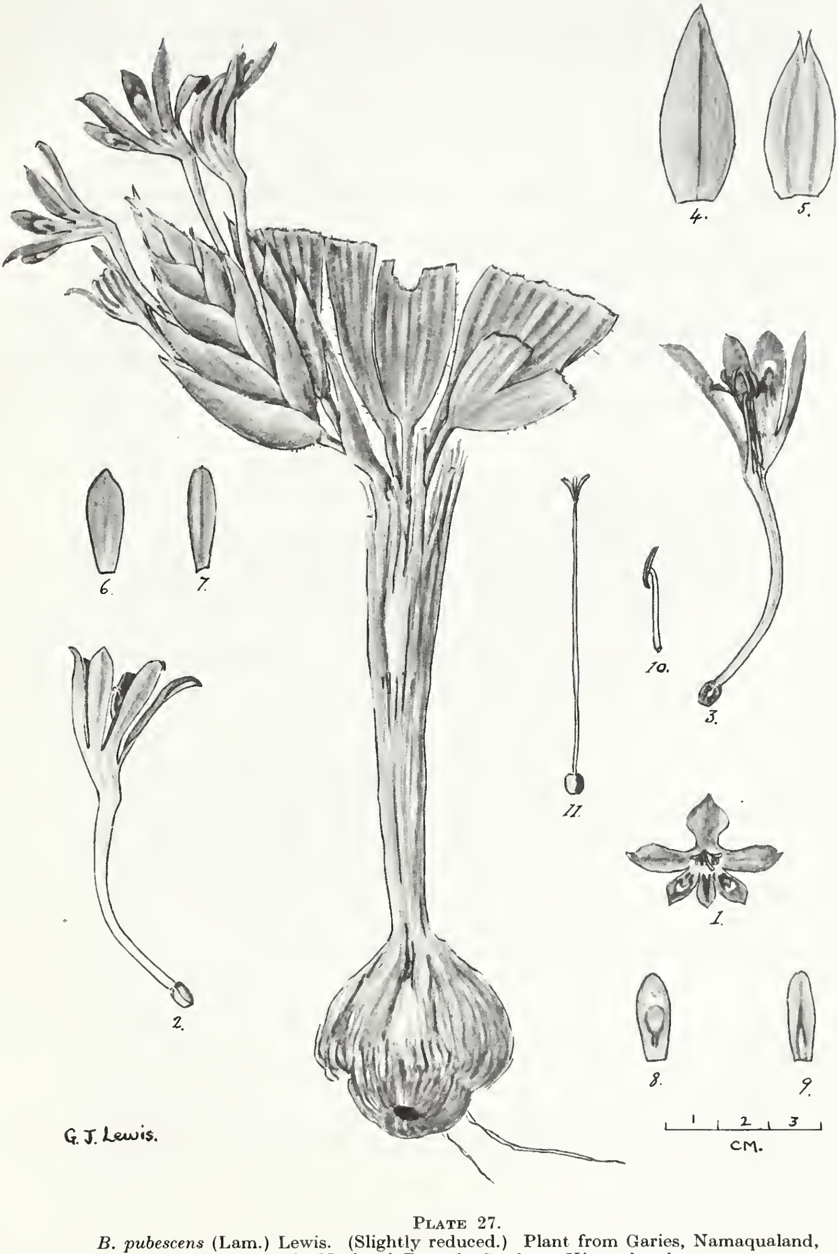

PLATE 27.

B. pubescens (Lam.) Lewis. (Slightly reduced.) Plant from Garies, Namaqualand, grown in National Botanic Gardens, Kirstenbosch.

1. Flower, front view. 2. Flower, side view. 3. Section of flower. 4. Bract. 5. Bracteoles. 6. Dorsal perianth lobe. 7. Upper lateral perianth lobe. 8. Lower lateral perianth lobe. 9. Lowest perianth lobe. 10. Stamen. 11. Gynaecium.

fontein: *Schoenfelder* 602. Anasberg: *Dinter* 2251. Okakueyo: *Dinter* 2647. Near Narubis: *A. Wilman* 436. Windhoek: *Liebenberg* 4565.

CAPE PROVINCE

PRIESKA. *Fuller* 220.

HAY. Griquatown: *Marloth* 7447. Postmasberg: *Louw* in Herb. Marloth 6533.

HERBERT. Douglas: *Anderson* in Herb. Marloth 6477.

KIMBERLEY. Kimberley koppies: *Wilman* (16021 in Herb. Bol.). Schuste Kama: *Lloyd* (3621 in McGregor Mus.).

BARKLY WEST. Noltes Puts: *Pringle* (3322 in McGregor Mus.). Newlands: *Paton* (3314 in McGreg. Mus.). Daniels Kuil: *Lewis* 600; *Acocks* 2298.

GRIQUALAND WEST. *Barber.* Diamond Fields, Du Toits Pan: *Barber* 13.

KURUMAN. Batharos: *Silke* 261.

VRYBURG. Pellat Plains, near Takun: *Burchell* 2241. Vryburg: *Mogg* 8849. Near Armadillo Creek: *Burtt Davy* (13778, 13903 in Nat. Herb., Pretoria); *Sharpe* (7729 in Nat. Herb., Pre.); *Henrici* 154.

MAFEKING. Near Mafeking: *Bolus* 6452; *Wilman.* Fifty-six miles from Mafeking on road to Vryburg: *Codd* 1319.

ORANGE FREE STATE. Near Modder River: *Hutton.*

TRANSVAAL

WOLMARANSSTAD. Strydpoort: *Sutton* 260.

MARICO. Zeerust: *Marloth* 9538.

RUSTENBURG. *Pegler* 1111; *Nation* 185; *McLea* in Herb. Bolus 2654; *Burtt Davy* 160; *Allan* (6458 in Nat. Herb. Pre.); *Rogers* 18722.

GERMISTON. Modderfontein: *Conrath* 589.

PRETORIA. *Smith* 43, 6560 a; *Steyn* 981; *Pont* 1199. Rooikop: *Smuts* 1650. Klapper Kop: *Mogg* 16057, 16183. Triehardopoort: *Bredell* 13. Irene: *De Jongh* in Herb. Galpin 5626. Littleton: *Inglis* (27229 in Nat. Herb., Pre.). Kaalfontein: *Pole Evans* (13357 in Nat. Herb., Pre.). Near Hamans Kraal: *Meeuse* 9001.

JOHANNESBURG. Strubens Valley, Johannesburg: *Brent* 30. Krugersdorp: *Hards* 69. Gold Fields: *Baines* (type of *B. Bainesii*, Kew Herb.). Near Johannesburg: *Saunders* 15; *Bryant* D 15; *Walt* and *Brandwyk* 2490; *Gilmore* 470; *Moss* 7159, 13000; *Rand* 1191; *Rogers* 18273; *Gerstner* 6406; *Galpin* 1403. Witwatersrand: *Hutton* (Albany Mus. 1009). Springs: *Repton* 963.

POTCHEFSTROOM. *Louw* 1440.

ERMELO. *Burtt Davy* (7709 in Nat. Herb., Pre.). Lake Chrissie: *Potgieter* 2.

BRONKHORSTSPRUIT. *Rehmann* 6574.

CAROLINA. Between Swaziland and Carolina: *Bolus* 12341. Carolina district: *Burtt Davy* 7359.

BELFAST. Dullstroom: *Galpin* 13174. Near Belfast: *Van der Merwe* 1257; *Hutchinson* 2789. Draaikraal, about 50 miles N. of Belfast: *Reynolds* 5892.

MIDDELBURG. Near Olifants River: *Dyer* 3935; *Nelson* 396. Witbank: *Rand* 195; *Schlechter* 4055 (type of *B. Bakeri*, in Zürich Un. Herb.).

LYDENBURG. *Wilms* 1424.

WATERBERG. *Bradfield* 197.

LICHTENBURG. *Kinges* 1703.

BECHUANALAND. Mochudi: *Harbor* in Herb. Rogers 6619; *Harbor* 820. Kanye: *Marloth* 2160.

SOUTHERN RHODESIA. Matopos: *Flanagan* 2949. Bulawayo-Gwanda road: *Cheesman* 202. Fort Victoria-Gwelo: *Pole Evans* 2731. Salisbury: *Flanagan* 3249. Umtali, Odzani River Valley: *Teague* 488. Manyika Bridge: *Shepherd* 1.

This is the most widespread species and the only one which extends into Tropical Africa. Burchell, in his description of the type, remarked on the variations in the width of the leaves and noted that some were glabrous and others villous. In colouring and size the flowers also vary considerably. The form previously known as *B. Bainesii*, which is fairly common in many parts of the Transvaal, has larger flowers than the type but is connected by intermediates and cannot be upheld as a separate species or even a variety. *B. Bakeri* Schinz is this species; the bracts were described as "8—9 lin. longa" but this is a mistake as they are about 4 cm. long in the type.

B. hypogea Burch. var. **ensifolia** Lewis var. nov.

Cormus ad 30 cm. infra terram positus. *Folia* ensiformia, acuta, subglabra vel minute et parce hirsuta, ad basin plicata, 4—14 cm. longa, ad 1·4 cm. lata. *Bractea* glabra in parte dimidia inferiore membranacea, acuta vel acuminata, circa 4·5 cm. longa. *Perianthii tubus* 4—4·5 cm. longus; *segmenta* obtusa vel subacuta, 3—3·5 cm. longa, 0·8—1 cm. lata. *Stamina* arcuata filamentis 1 cm. longis antherisque 8 mm. longis.

Corm very deep seated, up to 30 cm. below ground. *Leaves* ensiform, acute, subglabrous or minutely and sparsely pubescent, plicate at the base, 5—14 cm. long, up to 1·4 cm. wide. *Bract* glabrous, the lower half membranous, acute or acuminate, about 4·5 cm. long. *Perianth tube* 4—4·5 cm. long; *lobes* obtuse or subacute, 3—3·5 cm. long, 0·8—1 cm. wide. *Stamens* arcuate; filaments 1 cm. long; anthers 8 mm. long.

Among rocks from Carnarvon to Murraysburg, at about 1,350 m. altitude.

TYPE. *Tyson* 312 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August.

CARNARVON. *Vermeulen*, N.B.G. 2175/35.

MURRAYSBURG. Near Murraysburg: *Tyson* 312.

The comparatively short and broad leaves distinguish this from the var. *hypogea*. In appearance it approaches *B. sambucina* but the entirely subterranean stem, stipitate ovary and other characters are those of *B. hypogea*.

B. hypogea Burch. var. **longituba** Lewis var. nov.

Folia linearia, firme plicata, dense pilosa, circa 14 cm. longa, 3—4 mm. lata. *Bractea* et *bracteolae* supra medium dense pilosa. *Flores* purpureo-caerulei tubo perianthii ad 7 cm. longo et segmentis circa 4·5 cm. longis, 1·1 cm. latis. *Filamenta* 1·3—1·5 cm. longa; antherae 1·2 cm. longae.

Leaves linear, firmly plicate, densely pilose, about 14 cm. long, 3—4 mm. wide. *Bract* and *bracteoles* with the upper half densely pilose. *Flowers* mauve-blue, the perianth tube up to 7 cm. long, the lobes about 4·5 cm. long, 1·1 cm. wide. *Filaments* 1·3—1·5 cm. long; anthers 1·2 cm. long.

Among rocks on mountains in the Transvaal at about 2,230 m. altitude.

TYPE. *Schlechter* 4729 in the Bolus Herbarium.

Flowering period. February—March.

LYDENBURG. Mt. Myorul: *Schlechter* 4729. Houtboschberg: *Schlechter* 4443.

This variety differs from var. *hypogea* in having a much longer perianth tube and the leaves and bracts densely hairy. The altitude is the highest recorded for the genus.

49. **B. falcata** Lewis sp. nov.

Cormus ovoideus 2 cm. diam., tunicis e fibris tenuibus reticulatis pallide rubido-brunneis in collo 10—15 cm. longo productis, compositis. *Caulis* omnino subterraneus. *Folia* 6—7, linearia vel lineari-lanceolata, falcata, firma, pungentia, profunde plicata, villosa vel pubescentia, 2·5—7 cm. longa, 1·5—3 mm. lata. *Spica* brevissima, compacta floribus 2—6 infra terram ortis. *Bractea* oblongo-lanceolata, glabra, 3—3·5 cm. longa parte dimidia inferiore hyalina, superne viridis marginibus hyalinis angustis, ad apicem cuspide foliacea plerumque falcata induta; *bracteolae* coalitae bracteae aequales vel leviter longiores, superne virides, bicarinatae, bicuspidatae. *Flores* bilabiati, odorati, segmentis fulvis, extra nervo medio purpureo et intus purpureo-suffusis apicibus fulvis; segmenta inferiora lateralia medium versus pallide viridia inferne et in faucibus perianthii tubi rubido-purpurea; *perianthii tubus* cylindricus ad fauces leviter ampliatus, 3—3·8 cm. longus; *segmenta* plus minusve oblanceolata, acuta vel subacuta, exteriora mucronata, interiora interdum breviter cuspidata, 2·8—3·8 cm. longa, 0·8—1·2 cm. lata; segmentum dorsale liberum, quam 3 inferiora 0·7—1 cm. longius; segmenta lateralia superiora cum 3 inferioribus in labio breviter coalita. *Stamina* subarcuata filamentis 1·8 cm. longis antherisque 0·9—1 cm. longis. *Ovarium* oblongum, 5 mm. longum, glabrum, stipite brevissimo; stylus ad apicem antherarum attingens, ramis lineari-oblanceolatis conduplicatis 4 mm. longis.

Corm ovoid, 2 cm. diam.; tunics of fine reticulate pale reddish brown fibres, with a neck 10—15 cm. long. *Stem* entirely subterranean. *Leaves* 6—7, linear or linear-lanceolate, falcate, 2·5—7 cm. long, 1·5—3 mm. wide, firm and pungent, deeply plicate, villous or pubescent. *Spike* very short, compact, with 2—6 flowers arising below ground. *Bract* oblong-lanceolate, glabrous, 3—3·5 cm. long, the lower half hyaline, green above with narrow hyaline margins, terminating in a short foliaceous cusp which is usually falcate; *bracteoles* united, as long as the bract or slightly longer, the upper half green, bicarinate and bicuspidate. *Flowers* bilabiate, fragrant, the lobes buff or khaki-coloured outside with a purplish medial line, inside suffused with mauve, buff at the tips, the lower lateral lobes with a lime-green area near the middle, marked with purple-maroon below and at the throat of the perianth tube; *perianth tube* cylindric, slightly expanded to the throat, 3—3·8 cm. long; *lobes* more or less oblanceolate, acute or subacute, 2·8—3·8 cm. long, 0·8—1·2 cm. wide, the outer mucronate and the inner sometimes shortly cuspidate; dorsal lobe free, 0·7—1 cm. longer than the 3 lower; upper lateral lobes shortly united with the 3 lower in a lip. *Stamens* subarcuate; filaments 1·8 cm. long; anthers 0·9—1 cm. long. *Ovary* oblong, 5 mm. long, glabrous, very shortly stipitate; style reaching to top of anthers, with conduplicate linear-oblanceolate branches 4 mm. long.

In red soil on flats in South West Africa and from north-east of Springbok in Namaqualand to Kimberley and the Orange Free State.

TYPE. *Barker* 6671 in the Compton Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. July—September.

SOUTH WEST AFRICA. Between Tsirub and Graspoort: *Dinter* 1040.

NAMAQUALAND. Twenty miles E. of Springbok on road to Pofadder: *Barker* 6671. Without exact locality: *Krapohl* in Herb. Marloth 11236.

UPINGTON. The Halt, near Upington: *Glover* (12589 in Herb. Bol.).

HOPETOWN. Hopetown district: *Brice* (21178 in S. Af. Mus.).

HAY. Krantzkop: *Bryant* J 138. Langberg: *Hunter* 21.

KIMBERLEY. *Harris*, N.B.G. 852/50; *Fogarty* (4430 in S. Af. Mus.); *Verdoorn; Moran.*

ORANGE FREE STATE. Boshof district: *Burtt Davy* (10719 in Nat. Herb., Pretoria).

FAURESMITH. *Henrici* 3610.

ALLANRIDGE. *Lambert*, Herb. Moss 25982.

This species is allied to *B. hypogea* but has shorter falcate, firmer and pungent leaves, and flowers with very different colouring.

50. **B. flavida** Lewis sp. nov.

Cormus ovoideus 1·5—2·5 cm. diam., tunicis e fibris tenuibus pallide rubido-brunneis reticulatis in collo 6·5—10 cm. longo productis, compositis. *Caulis* omnino subterraneus, simplex. *Folia* 5, lanceolata, acuta, decumbentia, leviter plicata, pilosa, 3·5—5 cm. longa, 3—6 mm. lata. *Spica* compacta, 2—5-flora, floribus infra terram ortis. *Bractea* lanceolata, acuta vel acuminata, plus minusve membranacea, glabra, 2·5—5 cm. longa; *bracteolae* coalitae apicibus liberis subulatis, quam bractea leviter breviores vel longiores. *Flores* bilabiati, pallide luteo-brunnei vel fulvi, odorati; *perianthii tubus* gracilis, fauces versus ampliatus, 3·5—4 cm. longus; *segmenta* 3—3·7 cm. longa, 6—9 mm. lata, lanceolata apicibus longis acuminatis et dimidia vel tertia parte superiore recurva, dorsale liberum, quam 3 inferiora 4—5 mm. longius; segmenta lateralia superiora cum 3 inferioribus in labio breviter coalita. *Stamina* subarcuata filamentis circa 1·5 cm. longis antherisque 8 mm. longis, prope ad medium segmenti dorsalis attingentibus. *Ovarium* oblongum, 4—5 mm. longum, glabrum, stipite brevissimo; stylus fere ad apicem antherarum attingens, ramis filiformibus 2·5—3 mm. longis apice stigmatifero parvo obovato conduplicato.

Corm ovoid, 1·5—2·5 cm. diam.; tunics of soft pale reddish brown reticulate fibres, with a neck 6·5—10 cm. long. *Stem* entirely subterranean, simple. *Leaves* 5, lanceolate, acute, decumbent, slightly plicate, pilose, 3·5—5 cm. long, 3—6 mm. wide. *Spike* compact, 2—5-flowered, the flowers arising below ground. *Bract* lanceolate, acute or acuminate, more or less membranous, 2·5—5 cm. long; *bracteoles* united with free subulate tips, slightly shorter to slightly longer than the bract. *Flowers* bilabiate, pale yellow-brown, yellow or greenish yellow, fragrant; *perianth tube* slender, slightly widened towards the throat, 3·5—4 cm. long; *lobes*

3—3·7 cm. long, 6—9 mm. wide, lanceolate with long tapering acuminate tips and the upper half or third recurved, the dorsal free and 4—5 mm. longer than the 3 lower which are shortly united with the upper lateral lobes in a lip. *Stamens* subarcuate; filaments about 1·5 cm. long; anthers 8 mm. long, reaching to about the middle of the dorsal lobe. *Ovary* oblong, 4—5 mm. long, glabrous, very shortly stipitate; style reaching nearly to top of anthers, the branches filiform, 2·5—3 mm. long, with small obovate conduplicate stigmas.

In red sandy soil in the northern districts of the Cape Province.

TYPE. *Adams* 819 in the Bolus Herbarium.

Flowering period. Variable, usually March—May or July—September.

KENHARDT. Angelierspan, 40 miles N.W. of Marydale: *Story* 1152.

HERBERT. Mazelsfontein: *Anderson* 536. Koppies along the Orange River at Wexford: *Acocks* 8766.

WARRENTON. *Adams* 819.

VICTORIA WEST. Ten miles E. of Victoria West: *Comins* 827.

WITHOUT LOCALITY. *Fleck.*

B. flavida is allied to *B. hypogea* from which it is distinguished by the shorter decumbent leaves and differently coloured flowers with narrow long-tapering lobes recurved at or above the middle.

51. **B. tubulosa** (Burm. f.) Ker Gen. Irid. 154 (1827); Dur. & Sch. Consp. Fl. Afr. 5: 202 (1895), pro parte. *Ixia tubulosa* Burm. f. Fl. Cap. Prodr. 1 (1768), pro parte; Vahl Enum. 2: 76 (1806); Roem. & Schult. Syst. 1: 403 (1817). *Babiana tubata* (Jacq.) Sweet Hort. Brit. ed. I, 396 (1827) and ed. II, 500 (1830); Eckl. Top. Verz. 33 (1827); Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 181 (1892) and Fl. Cap. 6: 108 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 202. *B. tubiflora* (L. f.) Ker var. *tubata* (Jacq.) Ker, Bot. Mag. t. 680 (1803). *Gladiolus tubatus* Jacq. Ic. t. 264 (1786–93) and Coll. 5: 18 (1796); Willd. Sp. 1: 219 (1797); Poir. in Lam. Encyc. Suppl. 2: 793 (1812); Roem. & Schult. Syst. 1: 438; Vahl Enum. 2: 113. *G. tubati* var. Jacq. Ic. t. 265. *G. longiflorus* Andr. Bot. Rep. t. 5 (1797).

Corm ovoid or subglobose, 2—3·5 cm. diam.; tunics of fine pale brown or reddish brown fibres; neck wanting or somewhat sparse and seldom extending up to ground level. *Stem* about 7—12 cm. long below ground, the aerial part short, velutinous, usually declinate and 1—3-branched. *Leaves* 6—8, distichous, spreading fan-wise or suberect, lanceolate or ensiform, acute or occasionally acuminate, 4—15 cm. long, 0·6—2·2 cm. wide, plicate, pubescent. *Spike* distichous or secund, closely 8—12-flowered. *Bract* lanceolate, 2—4 cm. long, herbaceous, velutinous, densely villous at the base, the apex brown and somewhat membranous, usually acute; *bracteoles* shorter than the bract, lanceolate, united with free acuminate tips and hyaline margins. *Flowers* zygomorphic, more or less bilabiate, cream-coloured with red hastate or triangular marks on the 3 lower lobes, the tube flushed with purple or reddish purple outside and the outer lobes nearly always with a reddish medial line outside; *perianth tube* 6·5—9 cm. long, slender to above the middle and varying from narrowly to broadly infundibuliform towards the throat; *lobes* arising obliquely, unguiculate with oblong or ovate-oblong blades, obtuse or subacute, the outer mucronate; 3 upper lobes 3—3·4 cm. long, the dorsal 0·8—1·4 cm. wide, slightly or distinctly wider than the 2 lateral; 3 lower lobes 1·8—2·3 cm. long, 5—9 mm. wide. *Stamens* arcuate; filaments 2 cm. long; anthers 5—7 mm. long. *Ovary* rotund or globose, 3 mm. long, glabrous; style usually reaching to top of anthers or above, with linear-oblanceolate conduplicate branches 6 mm. long.

Confined to flats and low hills near the coast in the Hopefield and Malmesbury Divisions.

TYPE. *Burmann* in the Herb. Delessert, Geneva.

Flowering period. September—October.

HOPEFIELD. Saldanha Bay: *Parker* 4626; *Compton*, N.B.G. 1169/26; *Crosby*, N.B.G. 1866/22.

MALMESBURY. Groenekloof: *MacOwan* 2479; *Zeyher; Bolus* 3780; *Pappe.* Near Mamre: *Salter* 4895; *Hall* 164. Mamre hills: *Compton* 11767, 13889; *Wasserfall* 940. Near Darling: *Hutchinson* 224; *Lewis* 2219; *Bolus* 12847; *Guthrie* 2125; *Johns; Barker* 726. Between Mamre and Darling: *Leighton* 2131.

WITHOUT LOCALITY. *Burmann* (3 sheets named *Ixia tubulosa*); *Villett; Burchell; Drege* 8404, partly; *Harvey* 838; *Niven; Thunberg* (*Gladiolus ringens* sheet e); *Hahn.*

It is fairly evident from Burmann's description of *Ixia tubulosa* that more than one species must be involved, and an examination of the specimens so-named in his herbarium reveals the fact that they belong to three different genera. Three of the five sheets are *Babiana tubulosa* (Burm. f.) Ker and one of these should be regarded as the type; part of his description applies to these. (The other two are *Tritonia flabellifolia* (De la R.) Lewis and *Engysiphon pictus* (Foster) Lewis.)

Ker considered *B. tubata*, based on *Gladiolus tubatus* Jacq., to be a variety of *Babiana tubiflora* (L. f.) Ker, but not realizing that the plant figured by Jacquin was the same as *Ixia tubulosa* Burm. f., transferred the latter to Babiana as a separate species some years later. Most authors have treated *Babiana tubiflora* and *B. tubata* as separate species but I agree with Ker in regarding them as varieties of one species, for which the older name must now be used. The var. *tubulosa* is confined to a fairly small area in the Hopefield and Malmesbury Divisions and var. *tubiflora* is widespread, occurring in nearly all the coastal districts from Clanwilliam to the Cape and east to Riversdale. Both varieties are variable and some forms of var. *tubulosa* are distinguished from var. *tubiflora* only by the slightly more dilated perianth tube and longer lobes, though as a rule the plants are more robust, with wider leaves and larger flowers with the perianth tube broadly funnel-shaped towards the throat.

There has been some doubt about the identity of *Gladiolus ringens* sheet e in Thunberg's Herbarium but I have examined the specimen and am sure that it is *Babiana tubulosa* var. *tubulosa.* Baker cited it under *B. sambucina*, and according to a note by N. E. Brown in his paper on the South African Iridaceae in Thunberg's Herbarium (Journ. Linn. Soc. xlviii, p. 30 (1928)), it is "a very distinct species of Babiana that I cannot match with any specimens at Kew. It is not *B. mucronata* as named by Klatt."

B. tubulosa (Burm. f.) Ker var. **tubiflora** (L. f.) Lewis stat. nov. *B. tubiflora* (L. f.) Ker in Konig & Sims Ann. 1: 233 (1805), Bot. Mag. t. 847 (1805) and Gen. Irid. 153 (1827); Spreng. Syst. 1: 155 (1825); Eckl. Top. Verz. 33 (1827); Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 180 (1892) and Fl. Cap. 6: 108 (1896); Lewis in Adamson & Salter Fl. Cap. Pen. 244 (1950). *Gladiolus tubiflorus* L. f. Suppl. 96 (1781); Thunb. Diss. Gl. 20, t. 2, f. 2 (1784), Prodr. 9 (1794) and Fl. Cap. ed. Schultes 52 (1823); Ait. Hort. Kew. 1: 62 (1789); Jacq. Ic. t. 266 (1786–93); Willd. Sp. 1: 219 (1797); Vahl Enum. 2: 112 (1806); Lam. Encyc. 2: 728 (1786) and Illustr. 1: 119 (1791); Roem. & Schult. Syst. 1: 438 (1817); Réd. Lil. t. 361 (1813). *G. inclinatus* DC. in Réd. Lil. t. 144 (1802). *G. angustifolius* Lam. Illustr. 1: 119. *G. plicatus* Lam. Encyc. 2: 724; non L. (1762). *G. elongatus* Salisb. Prodr. 40 (1796). *Babiana tubiflora* (L. f.) Ker var. *filifolia* Pappe ex Baker, Handbk. Irid. 181. *B. tubulosa* (Burm. f.) Dur. & Sch. Consp. Fl. Afr. 5: 202 (1895), pro parte.

Corm ovoid, usually 1·5 cm. diam., from 5 to 20 cm. below ground; tunics of fine almost membranous fibres, the neck if present short and seldom extending up to the ground surface. *Stem* usually declinate and simple. *Leaves* 5—7, usually erect, subulate, linear-lanceolate or lanceolate, 4—18 cm. long, 3—6 mm. wide (occasionally to 1·3 cm.). *Spike* 2—many-flowered. *Bract* as in var. *tubulosa*, 3·5—6·5 cm. long. *Flowers* white or cream-coloured, the 3 lower lobes usually with a small red sagittate or W-shaped mark, the tube often pale mauve outside; *perianth tube* straight, slender, cylindrical, slightly widened towards the throat, 6·5—8 cm. long; *lobes* 1·5—2·3 cm. long, the 3 upper slightly longer than the 3 lower, all oblanceolate-unguiculate, oblong-unguiculate or spathulate, obtuse or acute, 3—6 mm. wide above the claw. *Stamens* suberect; filaments 1·3—1·6 cm. long; anthers 4—5 mm. long. *Gynaecium* as in var. *tubulosa* but style branches 3—4 mm. long.

Fairly frequent in white sandy soil on flats in the coastal districts from Clanwilliam to Riversdale.

TYPE. *Thunberg* in Herb. Thunberg, Botanical Museum, Uppsala.

Flowering period. September—October.

CLANWILLIAM. Otterdam: *Compton* 24192.

PIKETBERG. Het Kruis: *Stephens* and *Glover* 8607. Veloren Vlei: *Zinn* (52916 in S. Af. Mus.); *Barker* 2620. Sauer: *Barker* 2666; *Leighton* 126. Berg River: *Compton* 9466.

HOPEFIELD. Langebaan: *Lewis*, N.B.G. 2034/32; *Compton* 13215; *Martin*, N.B.G. 2862/35; *Davis* (61322 in S. Af. Mus.). Saldanha Bay: *Galpin* 11499; *Parker* 4630; *Marloth* 7226. Geelbek road: *Barker* 8163. Near Hopefield: *Letty* 19; *Lewis* 1051; *Bolus* 12848; *Compton* 15948; *Garside* 1599; *Bachmann* 888, 894, 2218.

MALMESBURY. Swartland: *Thunberg* (type). Groenekloof: *MacOwan* 544: *Zeyher*. Malmesbury: *Flanagan* 1737. Koperfontein: *Barker* 8056. Between Darling and Yserfontein: *Grant* 2593. Yserfontein: *Hall* 163. Near Mamre: *Leighton* 287; *Wasserfall* 444. Bok Point: *Compton* 9393; *Barker* 778.

CAPE. Paarden Island: *Compton* 13716. Between Vygeskraal and Blouberg: *Dod*. Strandfontein: *Barker* 1771. Blouberg: *Hurling* and *Neil* in Herb. Marloth 11953; *Stokoe* (67329 in S. Af. Mus.). Milnerton: *Lewis* 76. Riet Valley: *Zeyher* 91. Cape Flats: *Pappe* (21125 in S. Af. Mus., named *B. filifolia* MS.). Near Vygeskraal: *Dod* 1596. Flats at Mowbray: *Bolus* 3780. Dunes at Muizenberg: *Schlechter* 1487, 1489. Kommetjie: *Dod* 1667; *Salter* 333/11. Foot of Kanonberg: *Salter* 1729.

WYNBERG. Between Eersterivier and Swartklip: *Pillans* 9209.

SOMERSET WEST. Strand: *Strey* 591.

CALEDON. Near Houhoek: *Bolus* 9942.

RIVERSDALE. Near sea at Platteboseh: *Muir* 3446. Riversdale: *Muir* 5038.

WITHOUT LOCALITY. *Sparrman* 131, 200; *Jussieu* 3649 (named *Gladiolus plicatus*); *Lamarck* (*G. plicatus*—changed to *G. angustifolius*); *Lamarck* (*G. tubiflorus*); *Drege* 8403; *Harvey* 74, 847; *Drege* 8404, partly; *Thunberg* in Herb. Burmann (named *Ixia longiflora* and *Gladiolus longiflorus*); *Ecklon* 284; *Wallich* 1167; *Delessert*.

In his paper on the Iridaceae of Thunberg's Herbarium, N. E. Brown made the following note on *Gladiolus tubiflorus* (Journ. Linn. Soc. xlviii, p. 32 (1928)): "One sheet. This is *B. tubiflora* Ker and must be considered as the type of *G. tubiflorus* L. f., which was described from a specimen collected by Thunberg, as there is no specimen of Thunberg's collecting in the Linn. Herb. There are, however, in the Smith Herb., 3 specimens collected by Sparrman mounted on one sheet bearing the name *G. tubiflorus* which represent 3 species none of which is the same as *Gl. tubiflorus* Th. and cannot constitute the type of this species."

The sheet referred to by N. E. Brown is in the Linnaean Herbarium, No. 59.28 of Mr. Savage's Catalogue, and in Smith's writing it is named "*Gl. tubiflorus Thunb. Hb. & Supp.*" *Sparrman* Nos. 131 and 200 are on this sheet and according to Mr. Savage these were determined *G. plicatiformis* by Linnaeus in list 1772, a name which was not published. I cannot agree with N. E. Brown that these represent three species and consider that all are *Babiana tubulosa* var. *tubiflora*. None of them is the type, however, as the species was described from specimens collected by Thunberg. In the Smith Herbarium there is a specimen named *Gladiolus tubiflorus* and it is possible that N. E. Brown may have confused these two sheets.

Section Scariosae Lewis sect. nov.

Folia lanceolata vel lineari-lanceolata, plicata vel subplicata, velutina vel subglabra. Spica dense multiflora. Bractea et bracteolae omnino scariosae, pallide brunneae vel hyalinae brunneo-maculosae, bracteolae prope vel omnino liberae. Flores irregulares. Ovarium glabrum.

Leaves lanceolate or linear-lanceolate, plicate or subplicate, velutinous or subglabrous. Spike densely many-flowered. Bract and bracteoles entirely scariose, pale brown or colourless with brown flecks, the bracteoles free or almost so. Flowers zygomorphic. Ovary glabrous.

Type species: *B. spathacea* (L. f.) Ker.

52. **B. scariosa** Lewis sp. nov. (Plate 28).

Cormus ovoideus vel subglobosus 2·5—3 cm. diam., tunicis concretis e fibris sat robustis pallide rubido-brunneis superne in collo 10—15 cm. longo productis, compositis. *Caulis* erectus, gracilis, 10—15 cm. altus, ad medium foliis opertus, glaber vel hispidulus, ramis 3—4 brevissimis erectis. *Folia* 7—9, disticha, suberecta vel erecta, lanceolata vel lineari-lanceolata, acuminata, plicata, velutina, 15—25 cm. longa, 2—6 mm. lata. *Spica* disticha dense multiflora bracteis imbricatis. *Bractea* scariosa, lanceolata vel oblonga, acuminata vel longe aristata, 2—2·4 cm. longa, ad medium breviter lobata, carinata, glabra vel interdum carina hispidula, pallide brunnea vel hyalina et brunneo-striata; *bracteolae* bracteae similes sed breviores, liberae. *Flores* irregulares plus minusve bilabiati, lilacini segmentis inferioribus lateralibus pro parte majore pallide luteis vel lacteis apice lilacinis; *perianthii tubus* cylindricus supra medium leviter

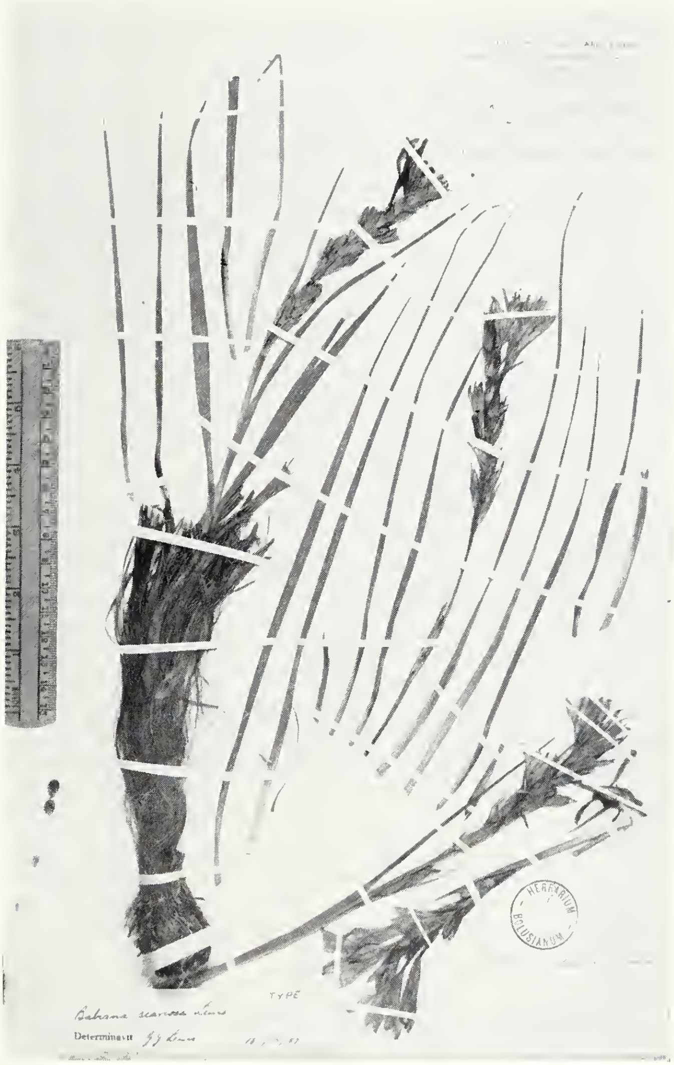

PLATE 28.
B. scariosa Lewis. Type sheet, in the Bolus Herbarium.

curvatus et leviter ad fauces ampliatus, circa 2 cm. longus; *segmenta* oblique orta, obtusa, exteriora mucronata, 3 superiora oblanceolata, dorsale plus minusve arcuatum, 2·2—2·5 cm. longum, 5—6 mm. latum, 3 inferiora anguste oblonga breviter unguiculata basi per 1 mm. coalita, 1·7—2 cm. longa, 4—5 mm. lata. *Stamina* arcuata filamentis 1·2—1·4 cm. longis antherisque 5—7 mm. longis. *Ovarium* rotundum, 4 mm. longum, glabrum; stylus prope ad medium antherarum attingens, ramis oblanceolatis conduplicatis 3—4 mm. longis.

Corm ovoid or subglobose, 2·5—3 cm. diam.; tunics matted, of fairly coarse pale reddish brown fibres, with a thick rope-like neck 10—15 cm. long. *Stem* erect, slender, 10—15 cm. high, the lower half enclosed within the imbricate leaf sheaths, with 3 or more very short erect branches. *Leaves* 7—9, distichous, suberect to erect, lanceolate or linear-lanceolate, acuminate, 15—25 cm. long, 2—6 mm. wide, firmly plicate, velutinous. *Spike* distichous, very densely many-flowered, the bracts closely imbricate. *Bract* scariose, carinate, glabrous or sometimes hispidulous on the carina, pale brown or colourless with brown flecks, lanceolate or oblong, acuminate or long-aristate, shortly lobed near the middle, 2—2·4 cm. long; *bracteoles* similar to the bract but shorter and narrower, free. *Flowers* zygomorphic, somewhat bilabiate, mauve, the lower lateral lobes pale yellow or cream-coloured tipped with mauve; *perianth tube* cylindric below, slightly curved above the middle and slightly widened to the throat, about 2 cm. long; *lobes* arising obliquely, obtuse, the outer mucronate, the 3 upper oblanceolate, the dorsal slightly apart from the others and more or less arcuate, 2·2—2·5 cm. long, 5—6 mm. wide, the 3 lower narrow-oblong, shortly unguiculate, united for about 1 mm. at the base, 1·7—2 cm. long, 4—5 mm. wide. *Stamens* arcuate; filaments 1·2—1·4 cm. long; anthers 5—7 mm. long. *Ovary* rotund, 4 mm. long, glabrous; style reaching nearly to middle of anthers, with oblanceolate conduplicate branches 3—4 mm. long.

Hills and mountain slopes in the Calvinia and Ladismith Divisions at altitudes of about 1,000 m.

TYPE. *Leipoldt* 3043 in the Bolus Herbarium.

Flowering period. August—September.

CALVINIA. Between Oorlogs Kloof and Papkuilsfontein: *Leipoldt* 3043.

LADISMITH. Western end of Touwsberg: *Wurts* 1433.

This species, with its dense spikes and scariose bracts, closely resembles *B. spathacea* but the flowers differ in colouring, the length of the perianth tube and in having much more irregular lobes. The scariose bracts and inflorescence of these two species distinguish them from all others in the genus.

53. **B. spathacea** (L. f.) Ker Bot. Mag. t. 638, excl. fig. et descr., and in Konig & Sims Ann. 1: 234 (1805); Spreng. Syst. 1: 155 (1825); Eckl. Top. Verz. 32 (1827); Baker, Journ. Linn. Soc. 16: 165 (1877), Handbk. Irid. 180 (1892) and Fl. Cap. 6: 108 (1896); Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895); N. E. Br. in Hook. Ic. Pl. 28, t. 2710 (1905). *Gladiolus spathaceus* L. f. Suppl. 96 (1781); Thunb. Diss. Glad. No. 25 (1784), Prodr. 9 (1794), Fl. Cap. 1: 208 (1807) and ed. Schultes 52 (1823); Willd. Sp. 1: 221 (1797); Lam. Encyc. 2: 728 (1786); Vahl. Enum. 2: 118 (1806); Roem. & Schult. Syst. 1: 443 (1817), pro parte. *G. paleaceus* Vahl. l.c. 118; Poir. in Lam. Encyc. Suppl. 2: 794 (1812); Roem. & Schult. l.c. 443. *Babiana densiflora* Klatt, Abh. Naturf. Ges. Halle 12: 348 (1882), Erganz. 14 (1882); Baker Handbk. Irid. 181 and Fl. Cap. 6: 109; Dur. & Sch. Consp. 5: 198.

Corm ovoid or globose, 1·5—2·5 cm. diam.; tunics matted, of soft reticulate fibres, with a thick neck 12—15 cm. long. *Leaves* 5—8, lanceolate or linear-lanceolate, acute or acuminate, 4·5—25 cm. long, 0·4—1·2 cm. wide, the lower more or less patent, the upper suberect to erect, plicate or subplicate, velutinous or hispidulous or subglabrous. *Stem* erect, 5—15 cm. high, terete, glabrous, more or less hidden by the leaves, simple or with 1—2 very short erect branches. *Spike* very densely many-flowered, the bracts closely imbricate. *Bract* lanceolate, long-aristate, 2·5—4·5 cm. long (with awn), 0·8—1 cm. wide, glabrous, scariose and hyaline with brown streaks; *bracteoles* free or almost so, like the bract, 1·5—2·7 cm. long. *Flowers* zygomorphic, white or cream-coloured with small red W-shaped marks at the base of the lower lateral lobes, the perianth tube purplish outside; *perianth tube* 3·5—4·5 cm. long, slender, geniculate near the throat and slightly wider above the bend; *lobes* subequal, narrow-oblong, obtuse, 1·4—2 cm. long, 3—4 mm. wide. *Stamens* subdeclinate, shortly exserted from the perianth tube, one slightly longer than the others; anthers 4—5 mm. long. *Ovary* rotund, glabrous, 3 mm. long; style reaching to middle of anthers or much above them, with linear-oblanceolate conduplicate branches 2—2·5 mm. long.

Confined to the Calvinia and Sutherland Divisions, in gravel soil on hills and at the foot of mountains, from 800 to 1,100 m. altitude.

Type. *Thunberg*, in Herb. Thunberg, Botanical Museum, Uppsala.

Flowering period. September—October.

Calvinia. Twelve and a half miles S.S.E. of Nieuwoudtville: *Acocks* 17416. Onder Bokkeveld and Hantam: *Thunberg*. Brand Vlei: *Johanssen* 14. Calvinia: *Thorne* (52506 in S. Af. Mus.); *Thode* A 1946. Near Hantams River, 30 miles N.W. of Calvinia on Loeriesfontein road: *Lewis* 2648. Moordenaarspoort, near Agter Hantamsberg, 26 miles N.E. of Calvinia: *Lewis* 2647. Hantam Mountains: *Meyer* (type of *B. densiflora* Klatt, in Berlin-Dahlem Herb.). Akkerdam, foot of Hantamsberg: *Acocks* 17760.

SUTHERLAND. Klipdrift: *Acocks* 17660 A.

The locality given for *Marloth* 7938 is "Saldanha Bay", but this is certainly a mistake.

In the Journal of the Linnaean Society, vol. xlviii, p. 30 (1928), N. E. Brown made the following note about the type of *B. spathacea:* "One sheet in Herb. Thunberg. This is *B. spathacea* Ker and must be taken as the type of *Glad. spathaceus* L. f. as there is no specimen in the Linn. Herb. In the Smithian Herb., however, there is a specimen of it received from Thunberg in 1791. It is not *B. tubiflora* as named by Klatt". Klatt evidently identified Thunberg's specimen with *B. tubiflora* and described plants collected by Meyer on the Hantam Mountains as a new species, which he named *B. densiflora.*

Ker confused this species with *B. sambucina* and the plant figured as *B. spathacea* in the Botanical Magazine, t. 638, is *B. sambucina.* His description is of the plant figured but the final paragraph refers to *Gladiolus spathaceus* L. f., viz.: "In some luxuriant dried native specimens the spathes are pellucid and their awns something longer than with us. The least pubescent of its family known to us. Found by Thunberg at the Cape in Bockland and Hantam." N. E. Brown pointed out Ker's misidentification in Hooker's Icones Plantarum, p. 2710, where *Babiana spathacea* is figured and described, and gave the name *B. Gawleri* to the plant figured in the Botanical Magazine.

Section Teretifoliae Lewis sect. nov.

Folia teretia, striata. Bractea et bracteolae herbaceae, glabrae, bracteolae ad medium coalitae. Flores irregulares perianthii tubo longissimo, gracili, cylindrico, vix ad fauces ampliato, et segmentis subaequalibus. Ovarium glabrum.

Leaves terete, striate. Bract and bracteoles herbaceous, glabrous, the bracteoles united to the middle. Flowers zygomorphic, with a very long slender cylindrical perianth tube scarcely widened to the throat, and subequal lobes. Ovary glabrous.

Type species: *B. brachystachys* (Baker) Lewis.

54. **B. brachystachys** (Baker) Lewis (Plate 29), Fl. Pl. of S. Afr. 14, p. 546 (1934). *Acidanthera brachystachys* Baker, Journ. Bot. (1876) 338, Journ. Linn. Soc. 16: 160 (1877), Handbk. Irid. 185 (1892) and Fl. Cap. 6: 130 (1896).

Corm subglobose, 3·5—4 cm. diam.; tunics of fairly soft matted reddish brown fibres, with a slender neck 15—30 cm. long. *Stem* very short, decumbent or declinate, simple or with 1—2 very short branches. *Leaves* in young plants very narrow, plicate, pilose, spirally twisted towards the apex, in mature plants about 9, erect, terete, rigid and striate, the margins of the short sheathing basal part long ciliate, glabrous above, up to 31 cm. long and 1·5—3 mm. diam. near the base. *Spike* dense, secund, 5—10-flowered, overtopped by the leaves. *Bract* lanceolate or ovate-lanceolate, acute, often apiculate, 2·2—3·5 cm. long, herbaceous, glabrous, the apex brown; *bracteoles* united for half their length, 2·2—3 cm. long, acuminate, herbaceous with hyaline margins. *Flowers* zygomorphic, pale salmon-pink, deeper pink outside, with small red marks at the throat inside and large red spathulate marks near the base of the lower side lobes; *perianth tube* slender, cylindrical throughout, very slightly widened to the throat, straight or slightly curved, 7—7·5 cm. long; *lobes* more or less patent, subequal, narrow-oblong or lanceolate, obtuse or subacute, slightly undulate, 1·5—2·4 cm. long, 6—8 mm. wide. *Stamens* suberect, one slightly longer than the others; filaments 4—5 mm. long; anthers 5 mm. long, very shortly exserted from the perianth tube. *Ovary* rotund, about 3 mm. long, glabrous; style reaching to top of anthers, with oblanceolate conduplicate branches 2—3 mm. long.

Particulars of the locality and habitat of the type are not known but plants found in Namaqualand were growing in thick white sand on flats near the coast. It probably occurs along the coastal belt from Lamberts Bay to Hondeklip Bay.

Type. *Mader* (Herb. MacOwan 2183) in Kew Herbarium.

Flowering period. September.

Clanwilliam. Without precise locality: *Mader* (Herb. MacOwan 2183).

Namaqualand. Between Hondeklip Bay and Wallekraal: *Lewis*, N.B.G. 2051/32.

This species is distinguished from all others by the terete leaves and long slender cylindrical perianth tube. It was described as an Acidanthera by Baker but he remarked that it connected Acidanthera with Babiana through *Babiana tubiflora*, and had more material been available he would no doubt have realized that it was a Babiana. The first leaves produced by young plants are linear, plicatè and pilose and these, as well as the deep-seated corm with its reddish brown tunics, are typical of the genus. There is no corm on the type specimen but there is one on an isotype in the South African Museum Herbarium.

Section Exohebeoides Lewis sect. nov.

Folia raro plicata et hispidula, saepe undulata vel spiraliter torta. Bractea et bracteolae herbaceae certe ad medium, bracteolae semper partim coalitae. Flores parvi (non ad 4 cm. longi) perianthii tubo brevi

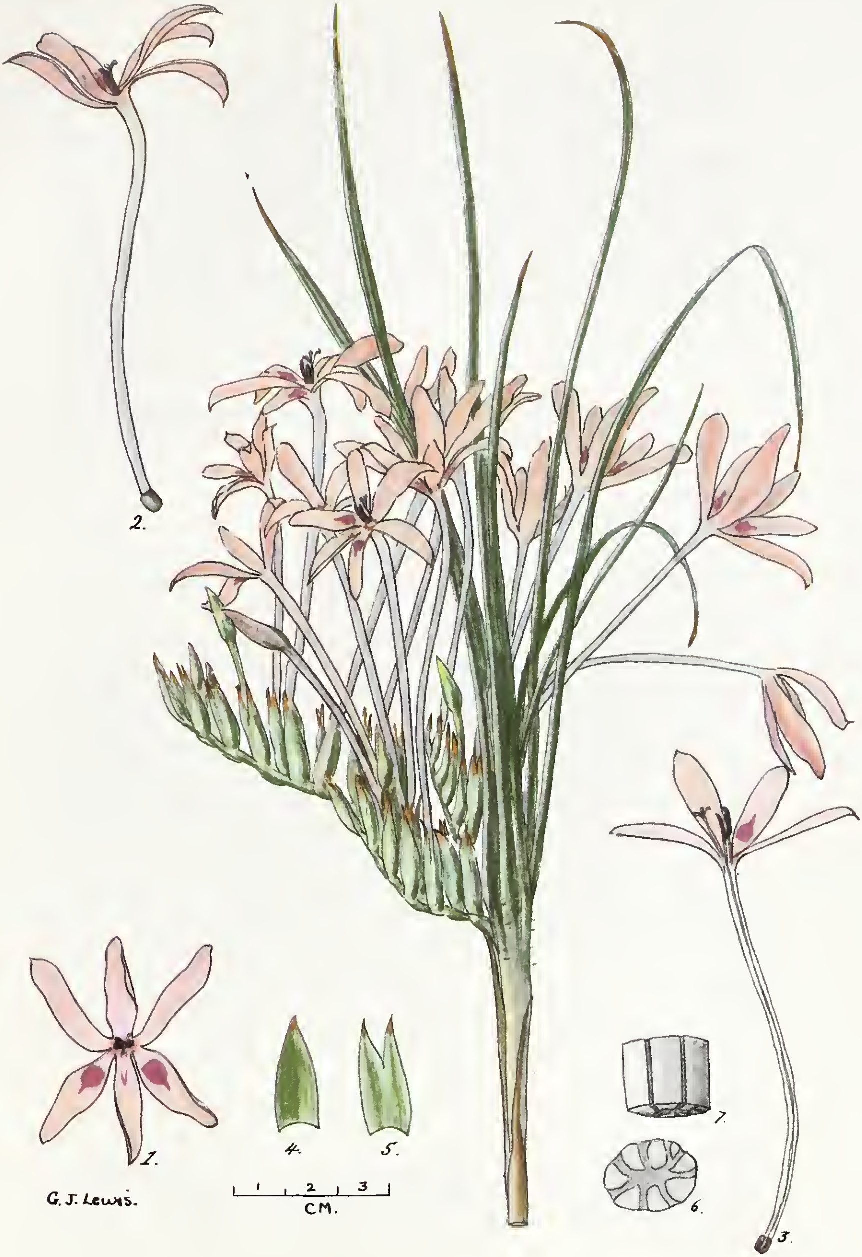

Plate 29.

B. brachystachys (Baker) Lewis. (Slightly reduced.) Plant from Namaqualand, grown in National Botanic Gardens, Kirstenbosch.

1. Flower, front view. 2. Flower, side view. 3. Section of flower. 4. Bract. 5. Bracteoles. 6. Transverse section of leaf × 6. 7. Portion of leaf × 6.

et segmentis unguiculatis valde irregularibus; segmentum dorsale ungue longo angusto, ab ceteris late separatum, primo arcuatum, plerumque deinde reflexum. Ovarium glabrum nisi tamen *B. unguiculata.*

Leaves rarely plicate and hispidulous, often undulate or spirally twisted. Bract and bracteoles herbaceous at least to the middle, the bracteoles always partly united. Flowers small (less than 4 cm. long) with a short perianth tube and very irregular unguiculate lobes, the dorsal with a long narrow claw, widely separated from the others, at first arcuate, later nearly always reflexed. Ovary glabrous except in *B. unguiculata.*

Type species: *B. striata* (Jacq.) Lewis.

55. **B. stenomera** Schltr. in Engl. Bot. Jahrb. 27: 100 (1900).

Corm ovoid, subtruncate at the base, about 1·8 cm. diam.; tunics of fine reddish brown reticulate fibres, with a neck about 12 cm. long. *Stem* erect, 8—12 cm. high, simple or with 1 or 2 short erect branches, puberulent or pilose. *Leaves* 7, distichous, patent or suberect, lanceolate or ensiform, acute, 6—8 cm. long, 5—8 mm. wide, glabrous, not or only slightly plicate. *Spike* distichous, fairly densely 4—8-flowered, the bracts imbricate. *Bract* lanceolate, acute or acuminate, striate, carinate, 1·8—2·2 cm. long, herbaceous, hispidulous at the base, glabrous above, the apex scariose; *bracteoles* slightly shorter than the bract, united to above the middle, carinate, acuminate, ciliate on the keel, the apex and margins membranous. *Flowers* bilabiate, blue, the lower lobes sulphur-yellow to the middle; *perianth tube* narrow, about 1·5 cm. long, slightly curved at the throat; *lobes* unguiculate, oblanceolate, acute or subacute, the outer mucronate; dorsal lobe free, arcuate, widely separated from the others, 2·5 cm. long, 5 mm. wide above the middle; upper lateral lobes 1·9—2 cm. long, 4 mm. wide, partly united with the 3 lower in a lip; 3 lower lobes about 2 cm. long, 3—4 mm. wide, united for 4 mm. at the base. *Stamens* arcuate; filaments 1·2—1·4 cm. long; anthers 5 mm. long. *Ovary* glabrous; style reaching to middle of anthers, with oblanceolate conduplicate branches 3—4 mm. long.

This species appears to be fairly local on stony hills in the northern part of the Vanrhynsdorp Division, up to 400 m. altitude.

ISOTYPE. *Schlechter* 8185 in the Bolus Herbarium.

Flowering period. August.

VANRHYNSDORP. Kareebergen (Karreeberg), near Nuwerus: *Schlechter* 8185. Holrivier: *Drege* 2624.

B. stenomera is a distinct species but is known only from dried material. From the specimens examined it appears to be fairly variable, with lanceolate or ensiform leaves; in some specimens of *Drege* 2624 the leaves

are up to 1·7 cm. wide and the bracts as well as the bracteoles are ciliate on the keels.

56. **B. sinuata** Lewis sp. nov. (Plate 30).

Cormus ovoideus, circa 1·5 cm. diam., tunicis e fibris sat tenuibus pallide brunneis in collo 8—10 cm. longo productis, compositis. *Caulis* erectus, saepe flexuosus, 10—25 cm. altus, ad medium vel ultra foliis opertus, subplanus, glaber, plerumque ramis 1—4 patentibus vel suberectis. *Folia* 6—8, disticha, suberecta, petiolis planis conduplicatis imbricatis supra terram longe productis, laminis lanceolatis, acuminatis, 2—8 cm. longis, 0·4—1·2 cm. latis, marginibus undulatis, striatis, nervo medio sat prominente, margines versus pilosis interdum solum basin versus, ceteroqui glabris glaucis. *Spica* laxe 3—7-flora, floribus spiraliter dispositis vel spica lateralis interdum secunda floribus leviter tortis et ad apicem caulis aspicientibus. *Bractea* lanceolata vel oblongo-lanceolata, acuta, 0·8—1 cm. longa, glabra, carinata, plerumque basin versus viridis, superne membranacea et pallide brunnea; *bracteolae* bracteae similes, ad medium coalitae. *Flores* bilabiati, odorati, pallide lilacini, segmentis inferioribus lateralibus infra medium purpureo-maculatis; *perianthii tubus* rectus vel superne leviter curvatus, ad fauces leviter ampliatus, 8—9 mm. longus; *segmenta* oblanceolata, unguiculata, obtusa, dorsale liberum, primo arcuatum, 2·2—2·5 cm. longum, 4—5 mm. latum, 2 lateralia superiora falcata, 1·7—2 cm. longa, 4 mm. lata, cum 3 inferioribus in labio brevissime coalita; segmenta 3 inferiora subaequalia, brevissime unguiculata, 1·2—1·4 cm. longa, circa 3 mm. lata. *Stamina* arcuata filamentis circa 2 cm. longis; antherae cohaerentes, raro liberae, 7 mm. longae. *Ovarium* oblongum, 2—3 mm. longum, glabrum; stylus ad apicem antherarum attingens, ramis brevissimis cuneatis 1—1·5 mm. longis.

Corm ovoid, about 1·5 cm. diam.; tunics of fairly fine pale brown reticulate fibres, with a neck 8—10 cm. long. *Stem* erect, often flexuose, 10—25 cm. high, the lower half or more enclosed in the leaves, flattened, glabrous, usually with 1—4 patent or suberect branches. *Leaves* 6—8, distichous, suberect, with flattened conduplicate imbricate petioles extending well above ground, loosely woolly at the base, the blades lanceolate, acuminate, 2—8 cm. long, 0·4—1·2 cm. wide, with undulate margins, striate with a fairly prominent mid-rib, pilose near the margins, sometimes only towards the base, otherwise glabrous and glaucous. *Spike* laxly 3—7-flowered, spirally arranged or the lateral sometimes secund with flowers facing the stem apex. *Bract* lanceolate or oblong-lanceolate, acute, 0·8—1 cm. long, glabrous, carinate, usually green at the base, membranous and pale brown above; *bracteoles* similar to the bract, united

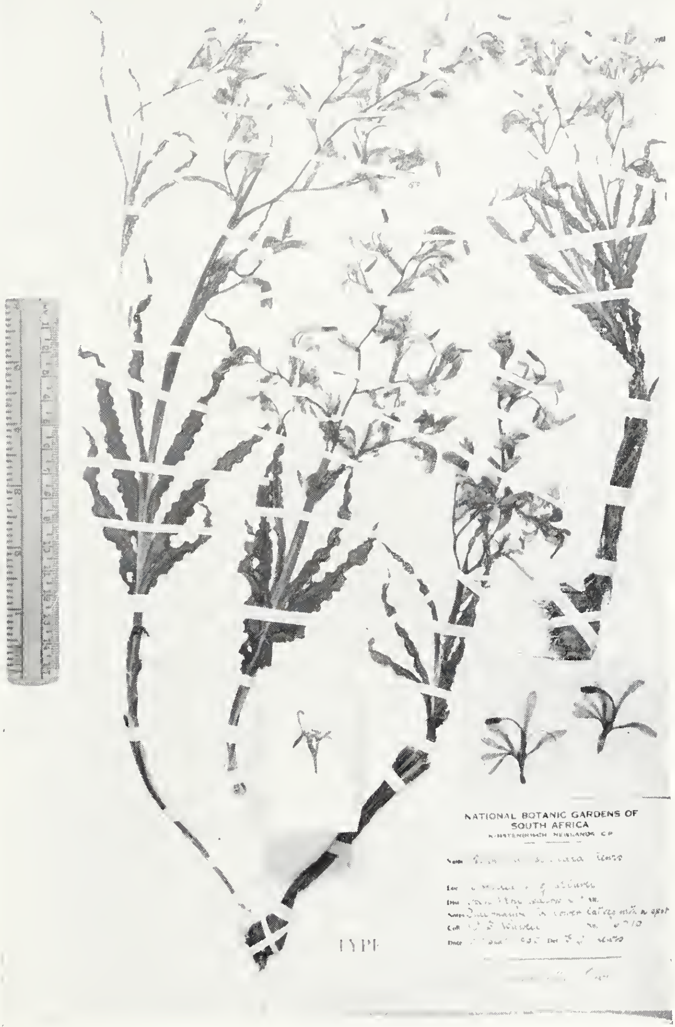

PLATE 30.
B. sinuata Lewis. Type sheet, in the Compton Herbarium.

to the middle. *Flowers* bilabiate, pale mauve, the lower lateral lobes with a purple spot below the middle, fragrant; *perianth tube* straight or slightly curved near the throat, very slightly widened upwards, 8—9 mm. long: *lobes* oblanceolate, unguiculate, obtuse, the dorsal free, widely separated from the others, at first arcuate, 2·2—2·5 cm. long, 4—5 mm. wide; upper lateral lobes falcate, 1·7—2 cm. long, 4 mm. wide, very shortly united with the 3 lower in a lip; 3 lower lobes subequal, very shortly unguiculate, 1·2—1·4 cm. long, about 3 mm. wide. *Stamens* arcuate; filaments about 2 cm. long; anthers coherent, rarely free, 7 mm. long. *Ovary* oblong, glabrous, 2—3 mm. long; style reaching to top of anthers, with very short cuneate branches 1—1·5 mm. long.

Reddish soil at low altitudes in the Olifants River Valley from the Clanwilliam to the Vanrhynsdorp Division.

TYPE. *Barker* 6710 in the Compton Herbarium, National Botanic Gardens.

Flowering period. August—September.

CLANWILLIAM. Between Greys Pass and Clanwilliam: *Bolus* (22570 in Herb. Bol.). Olifants River Valley: *Lavis* (18445 in Herb. Bol.). Doorn River Bridge: *Barker* 7399. South of Doorn River Bridge: *Barker* 6548.

VANRHYNSDORP. Ten miles S. of Klaver: *Barker* 6710; *Lewis* 2194. Near Klaver: *Barker* 5627. Sandkraal: *Barker* 5645, 5659. Near Vanrhynsdorp: *Marloth* 7468. Vuurfontein: *Schlechter* 10979.

When I transferred *Gladiolus striatus* to Babiana in 1941 (Journ. S.A. Bot. vol. 7, p. 55), I cited specimens of this species under *Babiana striata*. At that time only herbarium specimens had been seen, which seemed to match Jacquin's figure of *Gladiolus striatus*, but since then living plants have been examined and the following differences in the flowers noted: (i) The colouring of the flowers is different. (ii) The perianth lobes have flat margins whereas in *Babiana striata* 3 have undulate margins. (iii) The anthers are almost always coherent in *B. sinuata* and free in *B. striata*.

57. **B. striata** (Jacq.) Lewis, Journ. S.A. Bot. 7: 55 (1941). *Gladiolus striatus* Jacq. Ic. t. 260 (1786–93) and Coll. 5: 28 (1796); Vahl. Enum. 2: 72 (1806); Poir. in Lam. Encyc. Suppl. 2: 790 (1812); Baker, Handbk. Irid. 209 (1892) and Fl. Cap. 6: 148 (1896). *Tritonia striata* (Jacq.) Ker in Konig & Sims Ann. 1: 228 (1805); Gen. Irid. 117 (1827); Spreng. Syst. 1: 154 (1825). *Antholyza striata* (Jacq.) Klatt Erganz. 12 (1882). *Gladiolus formosus* Pers. Syn. 1: 44 (1805). *Hebea formosa* Eckl. Top. Verz. 42 (1827).

Corm subglobose, 2—3 cm. diam.; tunics of coarse dark brown fibres, with a neck 8—15 cm. long. *Stem* 8—12 cm. long, the lower half or more erect and enclosed in the leaves, the upper half more or less declinate, glabrous, simple or with 1—2 very short branches. *Leaves* 5—6, distichous, suberect, lanceolate, acuminate, 3—12 cm. long, 0·3—1·3 cm. wide, with long imbricate sheaths, the outer purple at the base and often loosely woolly, the blade undulate with deeply wavy margins, firm, striate, somewhat spirally twisted or recurved at the apex, glabrous or the margins sometimes minutely ciliate. *Spike* laxly or fairly closely 3—10-flowered, spirally arranged, or secund with the flowers facing the stem apex. *Bract* ovate, or ovate-oblong, acute, 1—1·5 cm. long, green with hyaline margins and the apex or upper half brown and scariose, soft; *bracteoles* as long as the bract or slightly shorter, acute or acuminate, united to the middle or slightly above, carinate, with wide hyaline margins. *Flowers* bilabiate, pale mauve with the lower lateral lobes pale yellowish green below the apex, or all lobes pale yellowish green, the 3 lower with faint purple markings; *perianth tube* 0·8—1 cm. long, slightly expanded to the throat; *lobes* unguiculate, obtuse or subacute, the outer mucronate or mucronulate, oblanceolate, 3—5 mm. wide, the inner wider with undulate margins, especially the 2 lower lateral; dorsal lobe free, at first arcuate, later erect or reflexed, widely separated from the others, 2·3—2·6 cm. long, up to 8 mm. wide; upper lateral lobes about 1·8 cm. long, partly united with the 3 lower in a lip; 3 lower lobes 1·4—1·6 cm. long, with claws 3—4 mm. long united for about 2 mm., the 2 lateral with blades 5—6 mm. wide, auriculate at the base. *Stamens* arcuate; filaments 1·5 cm. long; anthers 6 mm. long. *Ovary* oblong or rotund, 3—4 mm. long, glabrous; style reaching slightly above base of anthers, with oblanceolate conduplicate branches 3 mm. long.

Occasional on hills in Namaqualand.

TYPE. Jacquin Ic. t. 260.

Flowering period. June—July.

NAMAQUALAND. Seventeen miles S. of Garies: *Lewis* 2325. Mierhoofkasteel, 8½ miles S.W. of Nuwerus: *Lewis* 2195. Kubus (Richtersveld): *Verdoorn* 1832. Springbok or Garies: *van Heerde* (23639 in Herb. Bol.).

The specimens cited under *Babiana striata* in the Journal of South African Botany, vol. 7, p. 55, are *B. sinuata* (see note under that species). According to Jacquin the outer perianth lobes are pale mauve with a red median stripe in the lower half and the inner lobes yellowish, with undulate or crisped margins.

B. striata (Jacq.) Lewis var. **planifolia** Lewis var. nov.

A var. *striata* tunicis cormi mollioribus, rubido-brunneis, et marginibus foliorum non vel vix undulatis, differt. *Folia* lanceolata, interdum leviter spiraliter torta. *Bractea* 1·2—2 cm. longa.

Differs from var. *striata* in having softer reddish brown corm tunics

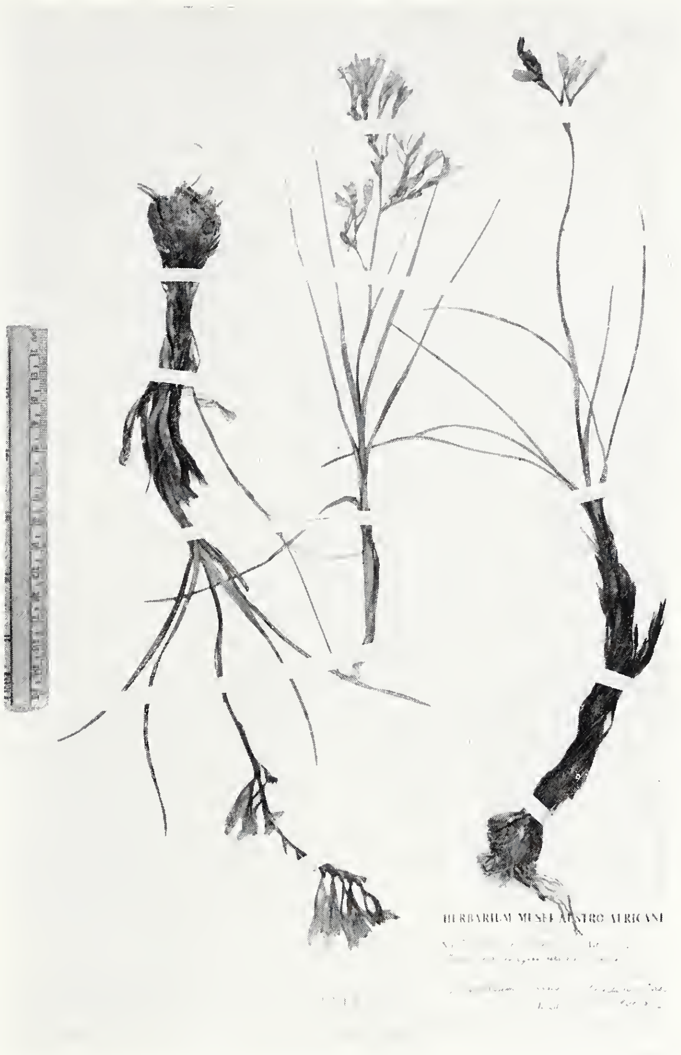

PLATE 31.
B. unguiculata Lewis. Type sheet, in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

and the margins of the leaves not or very slightly undulate. *Leaves* lanceolate, acuminate, not or very slightly undulate, sometimes slightly spirally twisted. *Bract* 1·2—2 cm. long.

TYPE. *Salter* 5554 in the Bolus Herbarium.

Flowering period. June—July.

NAMAQUALAND. Nine miles N.W. of Steinkopf: *Salter* 5554. Without exact locality: *Stanford* (in Herb. Bol.).

58. **B. unguiculata** Lewis sp. nov. (Plate 31).

Cormus subglobosus, 2—2·5 cm. diam., tunicis concretis e fibris brunneis in collo denso 10—12 cm. longo productis, compositis. *Caulis* erectus, aliquid flexuosus vel interdum supra medium declinatus, hispidulus, 10—20 cm. altus, simplex vel 1—3 ramis. *Folia* 6—7, patentia vel suberecta, linearia, firma, nervis 2—3 prominentibus, plicata, glabra vel hispidula, interdum leviter torta, inferiora 11—15 cm. longa, supremum caulinum, 3—6 cm. longum, supra terram 5—6 cm. ortum. *Spica* sat dense 4—8-flora floribus spiraliter dispositis, vel spica secunda floribus leviter tortis et ad apicem caulis aspicientibus. *Bractea* oblongo-ovata, acuta, 6—8 mm. longa, herbacea, hispidula, apice brunnea membranacea ciliata; *bracteolae* quam bractea aequilongae vel leviter longiores, basin versus vel ad medium coalitae, carinatae, acuminatae, marginibus latis hyalinis. *Flores* bilabiati, sulphurei; *perianthii tubus* curvatus, ad fauces leviter ampliatus, 0·8—1 cm. longus; *segmenta* unguiculata, nisi tamen 2 lateralia omnia oblanceolata, obtusa, 5—6 mm. lata, exteriora mucronulata et plerumque nervo medio extrinsecus minute ciliato, dorsale liberum, primo arcuatum, 2—2·4 cm. longum, 2 lateralia superiora circa 1·6 cm. longa, cum 3 inferioribus in labio partim coalita; segmenta 3 inferiora unguibus 5—7 mm. longis per 3—4 mm. coalitis, laminis circa 1 cm. longis, 2 lateralibus oblongis, obtusis. *Stamina* arcuata filamentis 1·3—1·5 cm. longis antherisque 5—6 mm. longis. *Ovarium* rotundum, 3 mm. longum, pubescens vel hispidulum; stylus ad medium antherarum attingens, ramis filiformibus 2—2·5 mm. longis apicem versus leviter ampliatis conduplicatis.

Corm subglobose, 2—2·5 cm. diam.; tunics matted, of brown fibres, with a thick rope-like neck 10—12 cm. long. *Stem* erect, somewhat flexuose, or sometimes subdeclinate above the middle, hispidulous, 10—20 cm. high, simple or with 1—3 branches. *Leaves* 6—7, patent or suberect, linear, firm with 2—3 prominent veins, plicate, glabrous or hispidulous, sometimes slightly twisted, the lower 11—15 cm. long, the uppermost cauline, 3—6 cm. long, arising 5—6 cm. above ground. *Spike* fairly closely 4—8-flowered, spirally arranged, or secund with the flowers facing the stem apex. *Bract* oblong-ovate, acute, 6—8 mm. long, her-

baceous, hispidulous, the apex brown, membranous and ciliate; *bracteoles* as long as the bract or slightly longer, united at the base or to the middle, carinate, acuminate, with wide hyaline margins. *Flowers* bilabiate, yellow; *perianth tube* curved, slightly expanded to the throat, 0·8—1 cm. long; *lobes* unguiculate, all except the 2 lower lateral oblanceolate, obtuse, 5—6 mm. wide, the outer mucronulate and usually minutely ciliate on the medial vein outside; dorsal lobe free, at first arcuate, widely separated from the others, 2—2·4 cm. long; upper lateral lobes about 1·6 cm. long, partly united with the 3 lower in a lip; 3 lower lobes with claws 5—7 mm. long, united for 3—4 mm., the blades about 1 cm. long, the 2 lateral oblong, obtuse. *Stamens* arcuate; filaments 1·3—1·5 cm. long; anthers 5—6 mm. long. *Ovary* rotund, 3 mm. long, pubescent or hispidulous; style reaching to middle of anthers, with filiform branches 2—2·5 mm. long, slightly expanded and conduplicate towards the apex.

Occasional on mountain slopes in the Clanwilliam Division above the Olifants River.

TYPE. *Stokoe* 8482 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flowering period. August—September.

CLANWILLIAM. Nardouw Pass: *Stokoe* 8482. Clanwilliam: *Leipoldt* 245.

This species resembles *B. fimbriata* but is distinguished by the much straighter and more rigid leaves, pubescent ovary and differently coloured flowers.

59. **B. fimbriata** (Klatt) Baker (Plate 32), Journ. Linn. Soc. 16: 166 (1877), Handbk. Irid. 182 (1892) and Fl. Cap. 6: 111 (1896). *Antholyza fimbriata* Klatt, Linnaea 35: 299 (1867–68); Erganz. 11 (1882). *Babiana spiralis* Baker Handbk. Irid. 183 and Fl. Cap. 6: 111; Dur. & Sch. Consp. Fl. Afr. 5: 201 (1895); Lewis, Fl. Pl. of S. Afr. 18, t. 686 (1938).

Corm ovoid, about 2 cm. diam.; tunics of fine submembranous reddish brown fibres, with a neck 12—14 cm. long. *Stem* erect, slender, the lower half or more enclosed in the leaves, the upper part usually flexuose, glabrous, hispidulous or pubescent, overtopping the leaves, with 1—3 short patent or suberect branches. *Leaves* 5—8, with long suberect petioles, those of the outer leaves slender and subterete, of the inner wider, conduplicate and clasping the stem, the blade linear or lanceolate, acuminate, 6—10 cm. long, 1—5 mm. wide, more or less plicate, glabrous or hispidulous on the margins only or sometimes also on the veins, spirally twisted or curled, usually recurved or spreading above the middle. *Spike* fairly laxly 5—8-flowered, spirally arranged, or secund with the flowers facing the stem apex, usually the terminal spiral and the lateral secund. *Bract* oblong, cuspidate, 0·8—1 cm. long, herbaceous with membranous

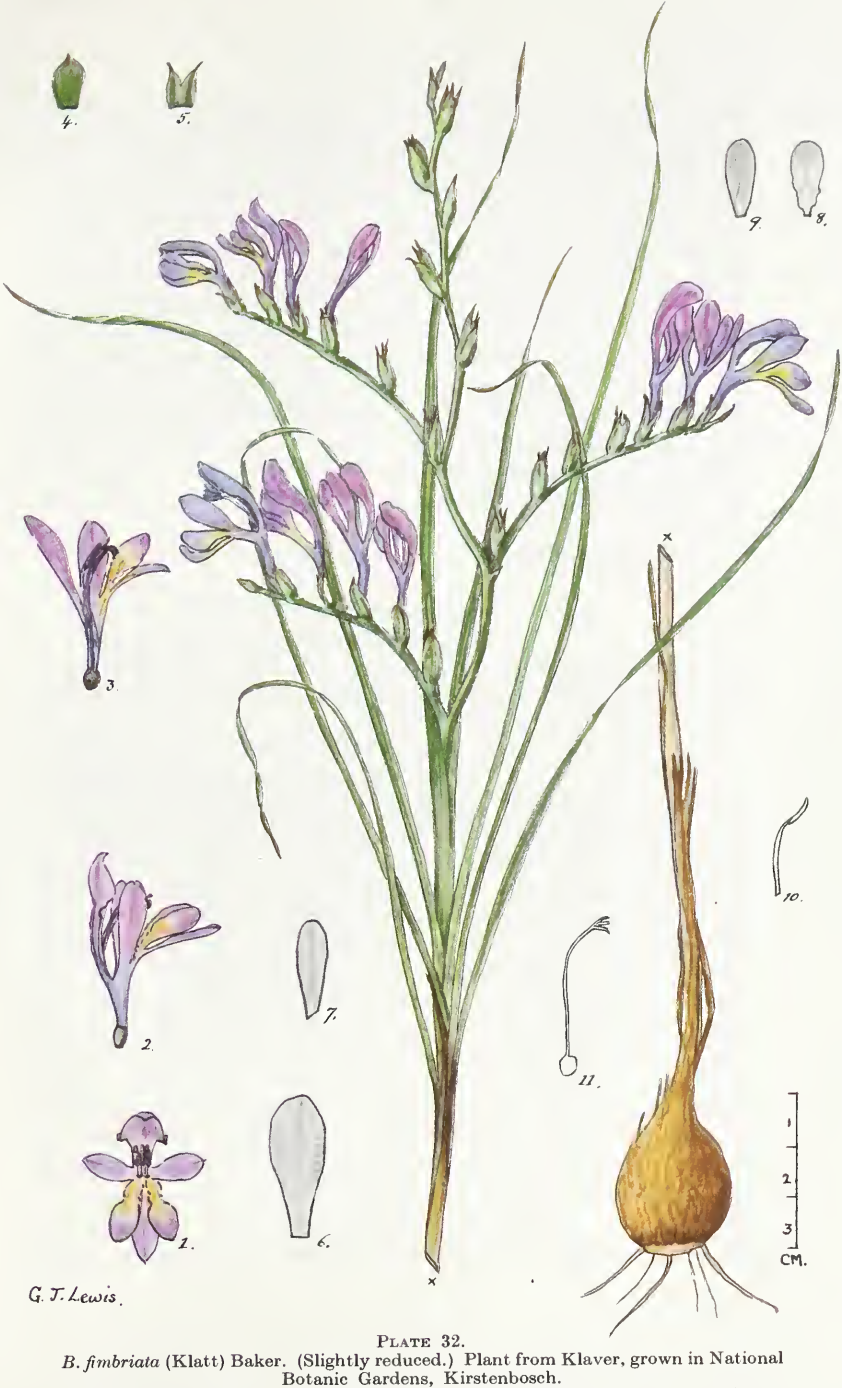

PLATE 32.

B. fimbriata (Klatt) Baker. (Slightly reduced.) Plant from Klaver, grown in National Botanic Gardens, Kirstenbosch.

1. Flower, front view. 2. Flower, side view. 3. Section of flower. 4. Bract. 5. Bracteoles. 6. Dorsal perianth lobe. 7. Upper lateral perianth lobe. 8. Lower lateral perianth lobe. 9. Lowest perianth lobe. 10. Stamen. 11. Gynaecium

brownish margins and apex, striate, glabrous or hispidulous on the medial vein, sometimes also near the margins; *bracteoles* similar to the bract and as long or slightly longer, united to above the middle. *Flowers* bilabiate, mauve, the lower half or more of the 3 lower lobes yellow; *perianth tube* straight or somewhat curved, slightly expanded to the throat, 0·8—1 cm. long; *lobes* unguiculate with oblong or oblanceolate obtuse blades, the outer mucronulate, the inner with slightly crisped margins; dorsal lobe free, widely separated from the others, arcuate, 2·5—2·8 cm. long, 0·6—1 cm. wide; upper lateral lobes 1·5—1·9 cm. long, 3—6 mm. wide, partly united with the 3 lower in a lip; 3 lower lobes 1·2—1·6 cm. long, 3—6 mm. wide, with claws 4—5 mm. long united for 2—3 mm., the blade of the 2 lateral auriculate at the base. *Stamens* arcuate; filaments about 1·5 cm. long; anthers 4 mm. long. *Ovary* oblong-rotund, 3 mm. long, glabrous; style reaching to middle or top of anthers, with short slender branches 2·5 mm. long, very slightly widened upwards and truncate.

Sandy soil at low altitudes in the Vanrhynsdorp Division and Namaqualand.

ISOTYPE. *Drege* 2619 in Kew Herbarium.

Flowering period. August—September.

VANRHYNSDORP. Klaver: *Lewis* (22161 in Herb. Bol.), N.B.G. 1486/32; *Stokoe* (59866 in S. Af. Mus.). South-west of Bitterfontein: *Hall* 1003.

NAMAQUALAND. Between Zwartdoorn River and Groen River: *Drege* 2619. Bitterfontein: *Schlechter* 11041.

WITHOUT LOCALITY. Herb. *Forsyth* (type of *B. spiralis*, in Kew).

The holotype of *B. fimbriata*, *Drege* 2619 in Herb. Lubeck, was not among the specimens sent to me on loan by the Director of the Berlin-Dahlem Herbarium, so it is presumed that it must be one of the specimens lost or destroyed during the war. Specimens of *Schlechter* 11041 named *B. fimbriata*, which must have been compared with the type, have been examined and were found to match the type of *B. spiralis*. The type of *B. spiralis* has been compared with the isotype of *B. fimbriata* in the Kew Herbarium and there can be no doubt that it is the same species. The leaves of *Drege* 2619 were described by Baker as "straight" (the only character on which he separated the species), but this is not correct as the few leaves on the two specimens are curled and twisted above the middle. The outer leaves have been eaten off but portions of the slender petioles characteristic of these leaves are present.

In the plants from Klaver figured as *B. spiralis* in Flowering Plants of South Africa, vol. 18, t. 686, the leaves are narrower, somewhat less twisted, almost glabrous and not conspicuously petiolate, but this can

only be regarded as a local form of *B. fimbriata*. Plate 32 in this revision is a reproduction of the plate which was published in Flowering Plants.

60. **B. tritonioides** Lewis sp. nov. (Plate 33).

Cormus globosus 1·5—2·5 cm. diam., tunicis e fibris brunneis ligneis reticulatis in collo 6·5—8·5 cm. longo productis, compositis. *Caulis* gracilis, erectus, 10—15 cm. altus, ad medium foliis opertus, plerumque ramosus ramis et spica terminali erectis vel persaepe declinatis et plus minusve horizontalibus. *Folia* 7—8, disticha, petiolis supra terram longe productis; lamina patens leviter spiraliter torta parte dimidia superiore erecta, lanceolata, acuta vel acuminata, 4—6 cm. longa, basi 0·6—1 cm. lata, glabra, glauca, non vel vix plicata, marginibus plerumque leviter undulatis; folia caulina 1—2, similia sed angustiora. *Spica* 7—10-flora, erecta rachide valde flexuoso et floribus spiraliter dispositis vel declinata et secunda. *Bractea* oblonga, glabra, carinata, acuta, 6—7 mm. longa, 3 mm. lata, parte dimidia inferiore viridi, superne scariosa, brunnea; *bracteolae* bracteae similes et plus minusve aequilongae, ad medium coalitae. *Flores* bilabiati, segmentis 3 superioribus obscure lilacinis, 3 inferioribus lacteis medium versus pallide viridibus; *perianthii tubus* 7—8 mm. longus; *segmenta* unguiculata, obtusa, dorsale liberum, spathulatum, arcuatum, 2·5 cm. longum apicem versus 6 mm. latum, 2 lateralia superiora 2 cm. longa, 4 mm. lata, cum 3 inferioribus in labio partim coalita; segmenta 3 inferiora 1·4—1·5 cm. longa, 4 mm. lata, unguibus 5—6 mm. longis per 2—3 mm. coalitis, 2 lateralia laminis oblongis basin versus auriculatis. *Stamina* arcuata filamentis 1·7 cm. longis antherisque 5 mm. longis. *Ovarium* subglobosum, 2·5 mm. longum, glabrum; stylus supra basin antherarum attingens, ramis filiformibus 3—4 mm. longis apice stigmatifero plus minusve orbiculato.

Corm globose, 1·5—2·5 cm. diam.; tunics of coarse somewhat woody brown reticulate fibres, with a neck 6·5—8·5 cm. long. *Stem* erect, 10—15 cm. high, slender, glabrous, terete or slightly flattened, the lower half enclosed in the leaf petioles, usually branched, the branches and terminal spike erect or more often declinate and more or less horizontal. *Leaves* 7—8, distichous, with petioles extending well above ground, the blade arising more or less at a right angle with a half spiral twist and the upper half erect, lanceolate, acute or acuminate, 4—6 cm. long, 0·6—1 cm. wide at the base, glabrous, glaucous, not or scarcely plicate, the margins usually slightly undulate; cauline leaves 1—2, similar but narrower. *Spike* erect with the rachis very flexuose and the flowers spirally arranged, or declinate and secund, 7—10-flowered. *Bract* oblong, acute, 6—7 mm. long, 3 mm. wide, carinate, glabrous, the lower half green, brown and scariose above; *bracteoles* similar to the bract and as

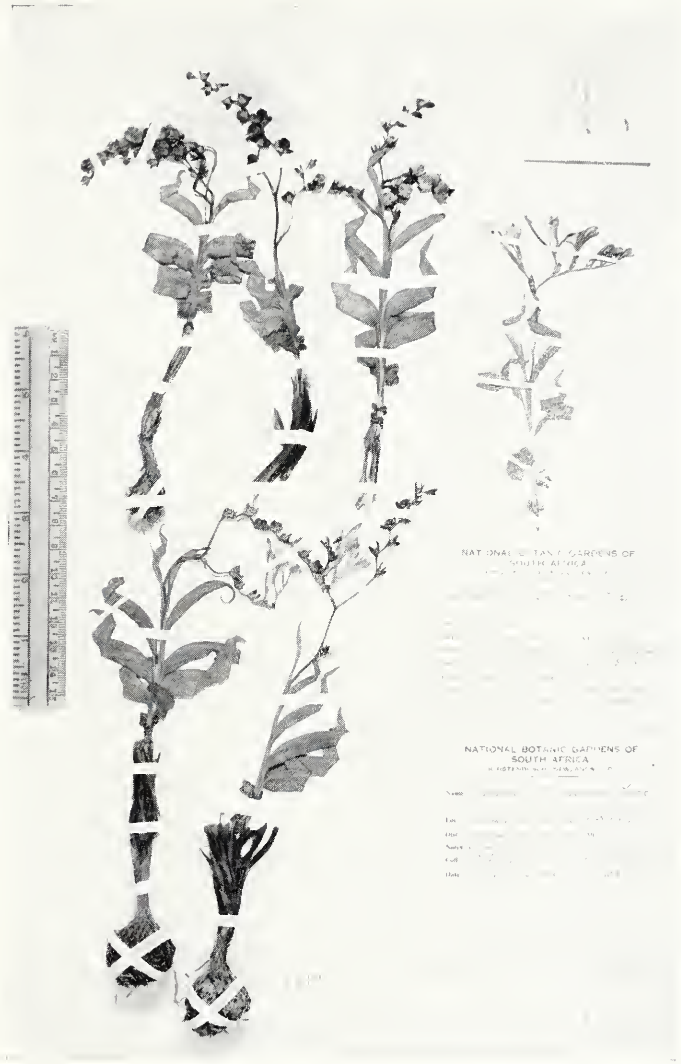

PLATE 33.
B. tritonioides Lewis. Type sheet, in the Compton Herbarium.

long or slightly longer, united to the middle. *Flowers* bilabiate, the upper lobes dull mauve, the 3 lower cream-coloured shading to green towards the centre; *perianth tube* 7—8 mm. long; *lobes* unguiculate, obtuse, the dorsal free, spathulate, arcuate, 2·5 cm. long, 6 mm. wide near the top; upper lateral lobes 2 cm. long, 4 mm. wide, partly united with the 3 lower in a lip; 3 lower lobes 1·4—1·5 cm. long, 4 mm. wide, with claws 5—6 mm. long united for 2—3 mm., the 2 lateral with oblong blades auriculate at the base. *Stamens* arcuate; filaments 1·7 cm. long; anthers 5 mm. long, reaching nearly to the top of the upper side lobes. *Ovary* subglobose, 2·5 mm. long, glabrous; style reaching above base of anthers, with filiform branches 3—4 mm. long.

Sandy plains in the north-western area of Namaqualand.

TYPE. *Barker* 6699 in the Compton Herbarium, National Botanic Gardens.

Flowering period. August—September.

NAMAQUALAND. Between Brakwater and Komaggas: *Barker* 6699. Richtersveld: *Marloth*. North of Ugrabis (? Oograbees, near Port Nolloth): *Marloth* 12668. Komaggas: *Kirstenbosch Expedition*, N.B.G. 1187/50.

A very distinct species, the corm, leaves, stem and very short bracts somewhat resembling those of one or two species of Tritonia. The whole plant is glabrous. The leaves in *Marloth* 12668 are wider than in the type, ovate-lanceolate and up to 1·8 cm. wide at the base, and in juvenile plants of the same collecting the petioles are filiform, from 1·5—4 cm. long.

61. **B. lobata** Lewis sp. nov.

Cormus ovoideus, 1·5 cm. diam., tunicis e fibris sat robustis rubidobrunneis reticulatis, in collo anguste cylindrico flexuoso 9·5 cm. longo productis, compositis. *Caulis* erectus, flexuosus, gracillimus, glaber, 12 cm. altus, ad medium foliis opertus, medium versus plus minusve dichotomo-ramosus. *Folia* 5—6, erecta, subulata, acuminata, ad 13 cm. longa, 1·5—3 mm. lata, glabra, plicata, spiraliter torta, marginibus leviter crispulatis. *Spica* laxe 7-flora, floribus spiraliter dispositis. *Bractea* oblongo-ovata, obtusa, 5—6 mm. longa, glabra, parte dimidia inferiore viridi-fusca, superne brunnea et membranacea; *bracteolae* quam bractea aequilongae vel leviter longiores, coalitae apicibus liberis mucronatis. *Flores* bilabiati, lilacini; *perianthii tubus* 8 mm. longus, ad fauces leviter ampliatus; *segmenta* unguiculata, 2 lateralia inferiora medium versus lobis magnis orbiculatis induta, cetera oblanceolata, 2·5—3 mm. lata, exteriora mucronulata, dorsale liberum, arcuatum, 1·8 cm. longum, 2 lateralia superiora circa 1·3 cm. longa, cum 3 inferioribus in labio partim coalita; 3 inferiora 1·3 cm. longa unguibus 5 mm. longis per circa 3 mm. coalitis. *Stamina* arcuata filamentis 1·6 cm. longis antherisque 3 mm. longis. *Ovarium* glabrum, 2—3 mm. longum; stylus non visus.

Corm ovoid, 1·5 cm. diam.; tunics of fairly coarse reddish brown reticulate fibres, with a narrow cylindrical flexuose neck 9·5 cm. long. *Stem* erect, flexuose, very slender, glabrous, 12 cm. high, the lower half enclosed in the leaves, somewhat dichotomously branched near the middle. *Leaves* 5—6, erect, subulate, acuminate, up to 13 cm. long, 1·5—3 mm. wide, glabrous, plicate, spirally twisted, the margins slightly crisped. *Spike* laxly 7-flowered, spirally arranged. *Bract* oblong-ovate, obtuse, 5—6 mm. long, glabrous, the lower half dark green, brown and membranous above; *bracteoles* as long as the bract or slightly longer, united with free mucronate tips. *Flowers* bilabiate, mauvish; *perianth tube* 8 mm. long, slightly expanded to the throat; *lobes* unguiculate, the 2 lower lateral with large rounded lobes near the middle, the others oblanceolate, 2·5—3 mm. wide, the outer mucronulate; dorsal lobe free, arcuate, widely separated from the others, 1·8—2 cm. long; upper lateral lobes about 1·3 cm. long, partly united with the 3 lower in a lip; 3 lower lobes 1·3 cm. long, with claws 5 mm. long, united for about 3 mm. *Stamens* arcuate; filaments 1·6 cm. long; anthers 3 mm. long. *Ovary* oblong, glabrous, 2—3 mm. long; style and style branches not seen.

TYPE. *Verdoorn* 1892 in the National Herbarium, Pretoria.

Flowering period. July—August.

NAMAQUALAND. Near Garies: *Verdoorn* 1892.

This very distinct species is described from a single specimen with only one open flower near the top of the spike, from which the style is missing. It is allied to *B. fimbriata* but differs in having more erect and less twisted leaves, and fairly large conspicuous lobes near the middle of the lower lateral perianth lobes, above the long slender claw.

SPECIES EXCLUDED

The following species have been excluded for various reasons, the majority owing to insufficient knowledge concerning them:—

Babiana caerulescens Eckl. Top. Verz. 32 (1827), *nomen nudum.* The description is brief and inadequate and three or four species were distributed under this name (see note under *B. patersoniae*).

B. gladiola Spreng. ex Steud. Nom. ed. II, 1: 176 (1840), *nomen nudum.* "In Zeyher Herb.", a MS. name.

B. longiflora Steud. l.c. 683=*Ixia paniculata* De la R.

B. mononeura Baker Handbk. Irid. 182 (1892) and Fl. Cap. 6: 110 (1896). This was described from a plant collected by Thunberg, without locality, and the specimen has not been traced. N. E. Brown made no reference to it in his paper on the South African Iridaceae in Thunberg's Herbarium (Journ. Linn. Soc. xlviii (1928)), nor did I see any Babiana answering to Baker's description when I examined Thunberg's collection in Uppsala. I do not know any species which answers to the description and am fairly certain that Baker must have described a Gladiolus and not a Babiana.

B. multiflora Klatt Abh. Naturf. Ges. Halle 12: 351 (1882) and Erganz. 16 (1882). The type, *Spilhaus*, from Porterville, in Herb. Lubeck, was not among the sheets sent on loan by the Director of the Berlin-Dahlem Herbarium and is therefore presumed to have been lost or destroyed during the war. From the description it is possibly *B. secunda* (Thunb.) Ker. Baker placed it as a variety of *B. stricta* in the Flora Capensis (6: 113).

B. nervosa Ker in Konig & Sims Ann. Bot. 1: 234 (1805)=*Anapalina revoluta* (Burm. f.) N. E. Br.

B. ochroleuca Sweet Hort. Brit. ed. I, 396 (1827), *nomen nudum*. There is no description nor reference to any illustration.

B. parviflora Brehm. ex Klatt l.c. 350 and 16. The type, *Drege* 1825 ex parte in Herb. Lubeck, has not been seen and is presumed to have been destroyed. According to the description the flowers are only about half an inch long (including the perianth tube). Baker placed it as a variety of *B. stricta* and it might perhaps have been described from a starved specimen of that species.

B. punctata Klatt l.c. 348 and 14. The type, *Leibold*, without locality, in Herb. Reg. Berol., has not been seen and is presumed to have been destroyed. It is not possible to place the species from the description. In the Flora Capensis *B. punctata* Klatt is given as a synonym of *B. plicata* Ker, but from the synonymy and specimens cited *B. plicata*, as defined by Baker, is a mixture of two or three species.

B. quadripartita Klatt l.c. 350 and 16. The type, *Spilhaus*, without locality, in Herb. Lubeck, is presumed to have been destroyed and without it I cannot come to any conclusion about the species. According to the description the flowers are large, with regular pink lobes 17 lines long and 3 lines broad. It might perhaps have been a poorly dried specimen of *B. blanda* which has large pink actinomorphic flowers with equal obovate or suborbicular lobes 2·3—3·3 cm. long and 1·4—2 cm. wide.

B. reflexa (Licht.) Ker Gen. Irid. 154 (1827). Ker was uncertain about the species which he thought might be either *B. plicata* or *B. stricta*. According to Sprengel it is *B. villosa*. I have not seen any specimen named *Gladiolus reflexus* by Lichtenstein so cannot come to any conclusion about its identity.

B. ringens (L.) Ker in Konig & Sims Ann. 1: 233=*Antholyza ringens* L. (See note by N. E. Brown in Trans. Roy. Soc. S. Afr. 20: 265 (1932).)

B. rosea Eckl. l.c. 32, *nomen nudum*. This might be the same as *B. villosa* (Ait.) Ker var. *grandis* Lewis but Ecklon's description is inadequate and I have not seen any specimens named by him.

B. stellata Eckl. l.c. 32, *nomen nudum*.

B. tenuiflora Sweet Hort. Brit. ed. I, 396, *nomen nudum*.

B. Thunbergii Ker in Konig & Sims Ann. 1: 233=*Anaclanthe plicata* (L. f.) N. E. Br., Trans. Roy. Soc. S. Afr. 20: 269 (1932).

B. umbellata Ker Gen. Irid. 31. This is *Bobartia umbellata* (Thunb.) Ker (=*Homeria umbellata* (Thunb.) Lewis); due to an error it was placed under Babiana instead of Bobartia in the Kew Index.

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LIST OF NUMBERED SPECIMENS QUOTED

The following abbreviations have been used:

Bolus Herbarium	BH
Herbarium Normale Austro-Africanum	HNAA
McGregor Museum	MM
National Botanic Gardens of South Africa	NBG
National Herbarium, Pretoria	NH
South African Museum Herbarium	SAM
Stellenbosch University Garden	SUG

Acocks. 2298 *hypogea;* 8766 *flavida;* 14707 *sambucina* v. *longibracteata;* 14708 *vanzyliae;* 14905 *mucronata* v. *minor;* 15401 *patersoniae;* 15418 *fourcadei;* 15455 *patersoniae;* 15485 *patula;* 15521 *sambucina;* 16472 *dregei;* 17009 *sambucina* v. *longibracteata;* 17416, 17760 A *spathacea;* 18506 *flabellifolia.*

Adams. 819 *flavida.*

Allan. NH 6458 *hypogea.*

Alston. Herb. Marloth 4568 *horizontalis.*

Anderson. 536 *flavida.*

Andreae. 505 *klaverensis;* 520 *ambigua;* 546 *ecklonii;* 1125 *blanda* x *villosula.*

Arbuthnot. NBG 1207/33 *villosula.*

Bachmann. 184 *pygmaea;* 522 *blanda;* 621 *rubrocyanea;* 651 *ambigua*, partly; 888, 894 *tubulosa* v. *tubiflora;* 2015 *ambigua* x *nana;* 2218 *tubulosa* v. *tubiflora.*

Balfour. 249 *socotrana.*

Barber. 13 *hypogea.*

Barker. 3 *purpurea;* 279 *auriculata;* 441 *plicata;* 442 *ambigua* x *nana;* 443 *ambigua;* 444 *ambigua* x *nana* v. *angustifolia;* 445, 446, 447 *blanda;* 448, 449 *villosula;* 452 *blanda* x *villosula;* 726 *tubulosa;* 727 *nana;* 778 *tubulosa* v. *tubiflora;* 801 *nana* v. *angustifolia;* 1128 *attenuata;* 1129 *auriculata;* 1130 *sambucina;* 1131 *dregei;* 1562 *villosula;* 1581 *ambigua;* 1771 *tubulosa* v. *tubiflora;* 1784 *ambigua;* 1797 *stricta;* 1809 *rubrocyanea;* 1817 *stricta* v. *regia;* 2424 *villosula;* 2478 *nana* v. *angustifolia;* 2518 *patula;* 2536, 2572 *pulchra;* 2620, 2666 *tubulosa* v. *tubiflora;* 2676, 2686 *pulchra;* 3027 *sambucina;* 3076 *lineolata;* 3090 *mucronata* v. *longituba;* 3601 *ambigua;* 3616, 3623 *ecklonii;* 3661 *dregei;* 3670, 3703, 3713, 3747 *curviscapa;* 3768 *ecklonii;* 3860 *stricta;* 4032 *villosula;* 4068 *odorata;* 4099 *blanda;* 4100 *ambigua;* 4120 *purpurea;* 4343 *pulchra;* 4565 *montana;* 4584 *villosula;* 4607 *obliqua;* 4618 *nana;* 4648 *plicata;* 4710 *auriculata;* 4778 *lineolata;* 4804 *pulchra;* 4805 *odorata;* 4810 *stricta* v. *sulphurea;* 4817 *stricta* v. *regia;* 5388 *ambigua;* 5506 *sambucina;* 5568 *patula;* 5627, 5645, 5659 *sinuata;* 5811, 5825 *pulchra;* 5596 *ecklonii;* 6188 *odorata;* 6242, 6305 *truncata;* 6362 *ambigua;* 6371 *stricta* v. *grandiflora;* 6412 *mucronata;* 6423 *scabrifolia;* 6428 *scabrifolia* v. *acuminata;* 6452 *sambucina* v. *longibracteata;* 6455 *vanzyliae;* 6499 *sambucina* v. *unguiculata;* 6548 *sinuata;* 6565 *geniculata;* 6566, 6587 *scabrifolia* v. *declinata;* 6601 *ecklonii;* 6606 *pubescens;* 6637 *curviscapa;* 6671 *falcata;* 6699 *tritonioides;* 6702 *curviscapa;* 6705 *mucronata;* 6710 *sinuata;* 6717, 7326 *mucronata;* 7338 *patula;* 7343 *foliosa;* 7360 *patula;* 7383 *purpurea;* 7399 *sinuata;* 7404 *pubescens;* 7429, 7431 *curviscapa;* 7436 *ecklonii;* 7486 *sambucina;* 7508 *stricta* v. *erectifolia;* 8056 *tubulosa* v. *tubiflora;* 8098 *pulchra;* 8112 *mucronata;* 8157 *nana;* 8163 *tubulosa* v. *tubiflora;* 8610 *leipoldtii;* 8646 *pulchra;* NBG 1568/30 *sambucina* v. *unguiculata.*

Bergh. BH 21399 *crispa.*

Bolus. 2623 *stricta* v. *erectifolia;* 3780 *tubulosa;* 3808 *plicata;* 4603 *stricta;* 4727 *villosula;* 4750 *nana* v. *angustifolia;* 5476 *villosa;* 6452 *hypogea;* 6579 *namaquensis;* 6580 *curviscapa;* 7284 *ambigua;* 9942 *tubulosa* v. *tubiflora;* 12341 *hypogea;* 12845 *pulchra;* 12846 *ambigua;* 12847 *tubulosa;* 12848 *tubulosa* v. *tubiflora;* 12850 *rubrocyanea;* 13652 *secunda;* BH 22570 *sinuata.*

Bolus, L. BH 15823 *stricta;* BH 19800 *framesii;* BH 19803 *sambucina* v. *longibracteata;* BH 20150 *curviscapa;* BH 20151 *villosula;* BH 20167 *pulchra;* BH 20199 *odorata;* BH 20287 *ambigua* x *nana* v. *angustifolia;* BH 21249 *blanda;* BH 23187 *mucronata;* NBG 1567/30 *vanzyliae;* NBG 1809/32 *odorata;* NBG 1828/32 *leipoldtii;* NBG 1848/32 *ambigua;* NBG 2958/32 *pulchra.*

Bolus, L. & Lewis. BH 20286 *scabrifolia;* NBG 1810/32 *nana;* NBG 1847/32 *klaverensis;* NBG 1849/32 *ecklonii.*

Bond. 358 *villosula;* 429 *nana;* 467 *patersoniae;* 602 *auriculata;* 1042 *odorata.*

Bowie. 1, 2 *plicata;* 6 *villosula;* 7 *stricta;* 411 *nana* v. *angustifolia.*

Bradfield. 197 *hypogea.*

Bredell. 13 *hypogea.*

Brent. 30 *hypogea.*

Bryant. D 15 *hypogea;* J 138 *falcata.*

Buhr. NBG 599/33 *framesii.*

Burchell. 2241 *hypogea;* 5806 *fourcadei;* 8489, 8553 *villosula.*

Burtt Davy. 160, 7359, 7709 *hypogea;* NH 10719 *falcata;* NH 13778, 13903 *hypogea;* NH 14207 *patersoniae.*

Cheesman. 202 *hypogea.*

Codd. 1319 *hypogea.*

Comins. 827 *flavida.*

Compton. 2699, 2856 *sambucina;* 5412 *curviscapa;* 5413 *dregei;* 6609 *curviscapa;* 7481 *nana;* 8976 *patula;* 9014 *ambigua;* 9183 *nana* v. *angustifolia;* 9393, 9466 *tubulosa* v. *tubiflora;* 10992 *scabrifolia;* 11256 *sambucina;* 11504 *truncata;* 11623 *pulchra;* 11638 *plicata;* 11755 *stricta;* 11767 *tubulosa;* 11778 *pulchra;* 11971 *plicata;* 13215 *tubulosa* v. *tubiflora;* 13343 *villosula;* 13389 *flabellifolia;* 13461 *stricta* v. *erectifolia;* 13716 *tubulosa* v. *tubiflora*; 13889 *tubulosa;* 14672 *nana* v. *angustifolia;* 14811 *stricta;* 15831 *fourcadei;* 15948 *tubulosa* v. *tubiflora;* 15949 *nana;* 15960 *pygmaea;* 16011 *stricta* v. *regia;* 17146, 17318 *ecklonii;* 17342, 17358 *ambigua;* 17443 *pulchra;* 18111 *blanda* x *villosula;* 18166, 18186 *nana* v. *angustifolia;* 18269 *plicata;* 18284 *stricta* v. *erectifolia;* 18328 *pulchra;* 18335 *stricta* v. *erectifolia;* 18373 *sambucina;* 20698 *ambigua;* 20973 *mucronata* v. *longituba;* 20982 *ambigua;* 22145 *stricta;* 22770, 24138 *ecklonii;* 24192 *tubulosa* v. *tubiflora;* 24214 *ambigua* x *scabrifolia;* 24240 *scabrifolia* v. *declinata;* NBG 1167/26 *pulchra;* NBG 1169/26 *tubulosa;* NBG 1885/36 *pulchra;* NBG 2009/36 *lineolata.*

Cook. NBG 1655/22 *patula.*

Conrath. 589 *hypogea.*

Cory. BH 20130 *patersoniae;* BH 22312, 22318, 22320 *sambucina.*

Crosby. NBG 1866/22 *tubulosa.*

Davis. SAM 59861, 59862 *nana;* SAM 59865 *blanda;* SAM 59868 *vanzyliae;* SAM 59872 *ambigua;* SAM 61058 *stricta* v. *erectifolia;* SAM 61322 *tubulosa* v. *tubiflora.*

Davison. NBG 2255/16 *pygmaea.*

Deas. NBG 2026/16 *pygmaea.*

Diels. 583 *sambucina* v. *longibracteata.*

Dinter. 1040 *falcata;* 2251, 2647 *hypogea;* 4007 *longicollis;* 6569 *namaquensis.*

Dod. 507 *plicata;* 508 *nana* v. *angustifolia;* 509 *stricta;* 589, 1197, 1255 *villosula;* 1346, 1381 *nana* v. *angustifolia;* 1405 *plicata;* 1406 *ambigua;* 1548 *stricta;* 1596, 1667 *tubulosa* v. *tubiflora;* 1770 *stricta.*

Drege. 2619 *fimbriata;* 2621 *curviscapa;* 2622 *ambigua;* 2623 *scabrifolia;* 2624 *stenomera;* 2625 *nana* v. *confusa;* 2626 *truncata;* 2627 *pubescens;* 2628 *dregei;* 8382 *nana;* 8383 *villosula;* 8384 *rubrocyanea;* 8385 *blanda;* 8386 *curviscapa;* 8387 *nana* v. *angustifolia;* 8388 *stricta;* 8389 *secunda;* 8390, 8390 b *stricta;* 8390 a *stricta*, partly; 8391 *stricta* v. *regia;* 8395 *sambucina;* 8396 *ambigua;* 8397 *curviscapa;* 8398, 8398 b *odorata;* 8401, 8402 *framesii* v. *kamiesbergensis;* 8403 *tubulosa* v. *tubiflora;* 8404 *tubulosa*, partly; 8404 *tubulosa* v. *tubiflora*, partly.

Dummer. 192 *pygmaea.*

Duthie. 863 *villosula.*

Dyer. 3935 *hypogea.*

Dymond. NBG 1849/33 *patula*, partly; NBG 1961/33 *sambucina.*

Eaton. NBG 1110/26 *blanda.*

Ecklon. 123 *plicata;* 124 b *villosula;* 125 b *stricta;* 126 *villosula;* 132 *lineolata;* 133 *ecklonii;* 159 *patersoniae;* 284 *tubulosa* v. *tubiflora.*

Ecklon & Zeyher. 77 *secunda;* 85 *ambigua*, partly; 122, 123 *nana;* 124 *nana* v. *angustifolia;* 129 *secunda;* 133 *ecklonii.*

Engels. NBG 4169/14 *lineolata.*

Esterhuysen. 1397 *framesii* v. *kamiesbergensis;* 2796 *villosula;* 3194 *auriculata;* 5372 *scabrifolia;* 5481 *minuta;* 5559 *ambigua;* 5901 *dregei;* 6124 *pulchra;* 8010 *auriculata;* 10289, 11826 *ambigua;* 12844 *villosula;* 14006 *sambucina;* 15984 *secunda;* 20338 *plicata;* 20591, 20671 *mucronata;* 23173 *ambigua*; NBG 2385/34 *lineolata;* NBG 1603/37 *blanda.*

Flanagan. 1737 *tubulosa* v. *tubiflora;* 1741 *pygmaea;* 2949, 3249 *hypogea.*

Fleck. 366 *hypogea.*

Fogarty. SAM 4430 *falcata.*

Fourcade. 1454 *patersoniae;* 1648 *sambucina;* 2311 *sambucina* v. *undulato-venosa;* 3308 *patersoniae;* 4765, 5245 *fourcadei;* 5377 *patersoniae.*

Fourie. BH 22316 *hypogea.*

Fries, Norlindh & Weimarck. 44, 1260, 1286 *patersoniae.*

Fuller. 220 *hypogea.*

Galpin. 1403 *hypogea;* 4703 *patersoniae;* 4704 *fourcadei;* 4705 *patersoniae;* 4706 *villosula;* 5460 *patula;* 11499 *tubulosa* v. *tubiflora;* 13174 *hypogea.*

Gamble. 22049 *villosula.*

Garabedian. SAM 50376 *odorata.*

Garside. 89 *pulchra;* 91 *purpurea;* 1599 *tubulosa* v. *tubiflora.*

Gerstner. 6406 *hypogea.*

Giffen. NBG 910/24 *minuta.*

Gillett. 133 *plicata;* 1167 *patcrsoniae;* 3674 *ecklonii;* 4098 *cedarbergensis;* 4286 *purpurea;* 4395 *stricta;* 4400 d *purpurea.*

Gilmore. 470 *hypogea.*

Glover. BH 12589 *falcata.*

Grant. 2249 *plicata;* 2328 *ambigua;* 2359 *odorata;* 2442 *villosa;* 2511 *stricta* v. *regia;* 2530 *pulchra;* 2593 *tubulosa* v. *tubiflora.*

Guthrie. 70 *nana* v. *angustifolia;* 2124 *pulchra;* 2125 *tubulosa;* 2698 *secunda.*

Hafstrom & Acocks. 273 *mucronata* v. *longituba;* 274 *sambucina.*

Hall. 163 *tubulosa* v. *tubiflora;* 164 *tubulosa;* 533 *minuta;* 1003 *fimbriata;* NBG 385/54 *torta;* NBG 414/56 *pilosa.*

Harbor. 820 *hypogea.*

Hards. 69 *hypogea.*

Harris. NBG 852/50 *falcata.*

Harvey. 74 *tubulosa* v. *tubiflora;* 75 *rubrocyanea;* 835 *stricta;* 838 *tubulosa;* 847 *tubulosa* v. *tubiflora.*

Heginbotham. 49 *villosa;* 101 *patula.*

Henrici. 154 *hypogea;* 3610 *falcata.*

Herre. SUG 3228, 3229, 3230 *curviscapa.*

Holland. 3631 *patersoniae;* NBG 1384/25 *patersoniae.*

Humbert. 9369 *villosula.*

Hunter. 21 *falcata.*

Hutchinson. 6 *villosula;* 173 *nana* v. *angustifolia;* 224 *tubulosa;* 882 *dregei;* 2789 *hypogea.*

Inglis. NH 27229 *hypogea.*

Johanssen. 14 *spathacea.*

Johnson. 177 *blanda;* 511 *ambigua.*

Jussieu. 3602 *ambigua*, partly; 3636 *stricta;* 3636 a *lineolata;* 3645 *plicata;* 3646 *villosula;* 3649 *tubulosa* v. *tubiflora.*

Kinges. 1703 *hypogea.*

Krause. 4370 *villosula.*

Krige. NBG 4346/14, 1468/15 *sambucina.*

Lamb. NBG 647/30 *pulchra;* NBG 1613/30 *cedarbergensis.*

Lavis. BH 20305 *secunda;* NBG 1592/30 *framesii.*

Leighton. 7 *nana;* 27 *nana* v. *angustifolia;* 126, 287 *tubulosa* v. *tubiflora;* 449 *pulchra;* 566 *blanda;* 625 *nana;* 635 *pygmaea;* 645, 646, 647 *stricta* v. *regia;* 1097 *ecklonii;* 1138 *curviscapa;* 1154 *dregei;* 1217 a *curviscapa;* 1251 *ecklonii;* 1283 *ambigua;* 1310 *villosa;* 1803 *villosula;* 1806 *blanda;* 1865, 1916 *nana* v. *angustifolia;* 2121 *pulchra;* 2131 *tubulosa;* BH 21469 *sambucina;* BH 21470 *lineolata;* BH 22764 *stricta* v. *erectifolia.*

Leipoldt. 245 *unguiculata;* 813 *vanzyliae;* 819 *sambucina* v. *longibracteata;* 3041 *lineolata;* 3042 *plicata;* 3043 *scariosa;* 3044 *vanzyliae;* 3045 *sambucina* v. *longibracteata;* 3046 *sambucina;* 3533 *dregei;* 3536 *ambigua;* 3538 *framesii* v. *kamiesbergensis;* 3873 *crispa;* 3875 *scabrifolia;* 3877 *vanzyliae;* 3878 *attenuata;* 3879 *sambucina* v. *longibracteata;* 4064, 4065 *sambucina;* 4066 *plicata;* BH 18559 *stricta* v. *erectifolia;* BH 20773 *geniculata;* BH 20774 *crispa;* NBG 981/39 *framesii* v. *kamiesbergensis;* SAM 55686 *leipoldtii.*

Leistner. 320 *sambucina* v. *longibracteata.*

Letty. 18 *ambigua;* 19 *tubulosa* v. *tubiflora;* 263 *pulchra;* 289 *nana* v. *angustifolia.*

Lewis. 25 *villosula;* 48 *nana* v. *angustifolia;* 53 *stricta;* 54 *ambigua* x *nana* v. *angustifolia;* 57, 60 *stricta;* 76 *tubulosa* v. *tubiflora;* 84 *nana;* 86 *stricta;* 100 *villosula;* 101 *blanda;* 105 *blanda* x *villosula;* 113 *ambigua* x *nana* v. *angustifolia;* 600 *hypogea;* 1051 *tubulosa* v. *tubiflora;* 1052 *rubrocyanea;* 1053 *pygmaea;* 1054 *obliqua;* 1055 *nana;* 1064 *blanda;* 1065 *ambigua;* 1214 *stricta;* 1337 *ambigua;* 1362 *mucronata* v. *longituba;* 1363 *ambigua;* 1365, 1366 *ecklonii;* 1367 *lineolata;* 1386, 1387, 1388 *curviscapa;* 1390 *pubescens;* 1391 *dregei;* 1408 *ecklonii;* 1877 *lineolata;* 1878 *auriculata;* 1879, 1880, 1881 *scabrifolia* v. *acuminata;* 1882 *crispa;* 1883 *minuta;* 1884 *sambucina* v. *longibracteata;* 1885 *flabellifolia;* 1886 *ambigua;* 1887 *ambigua* x *scabrifolia;* 1888, 1889 *scabrifolia;* 1891 *odorata;* 1892, 1893 *mucronata;* 2192 *scabrifolia* v. *acuminata;* 2193 *scabrifolia;* 2194 *sinuata;* 2195 *striata;* 2197 *stricta* v. *grandiflora;* 2198, 2199, 2200 *mucronata;* 2201 *ambigua;* 2203 *truncata;* 2204 *stricta;* 2205 *odorata;* 2206, 2207 *scabrifolia* v. *declinata;* 2208 *geniculata;* 2209 *sambucina* v. *unguiculata;* 2210 *sambucina* v. *longibracteata;* 2211 *vanzyliae;* 2215 *stricta* v. *regia* x *pulchra;* 2216 *stricta* v. *regia;* 2217 *stricta* v. *sulphurea;* 2219 *tubulosa;* 2220 *leipoldtii;* 2221, 2222, 2223 *pulchra;* 2224 *rubrocyanea;* 2225 *nana;* 2226 *nana* x *pulchra;* 2322 *minuta;* 2325 *striata;* 2645 *ambigua;* 2646 *pulchra;* 2647, 2648 *spathacea;* 2649 *sambucina;* 2650 *sambucina* v. *unguiculata;* 2651 *villosa* x *stricta* v. *erectifolia;* 2652 *plicata;* 2744 *curviscapa;* 2750 *pauciflora;* 2893 *stricta* v. *erectifolia;* 3568 *nana;* 3569 *mucronata;* 3570 *ambigua;* 3571 *pulchra;* 4411 *curviscapa;* 4412 *stricta* v. *regia;* 4413 *leipoldtii;* 4414 *attenuata;* 4415 *sambucina;* 4416 *curviscapa;* 4417 *secunda;* 4418 *pulchra;* 4458 *sambucina;* 4798 *nana* v. *confusa;* 4799 *sambucina;* 4800 *purpurea;* 4801 *pulchra;* 4802 *odorata;* 4803 *stricta* v. *erectifolia;* 5027 *scabrifolia* v. *declinata;* 5085 *pulchra;* 5228 *ambigua;* 5230 *villosa* v. *grandis;* BH 21856 *pulchra;* BH 22161 *fimbriata;* BH 22162 *pubescens;* BH 22170 *stricta* v. *erectifolia;* BH 22246 *auriculata;* BH 22247 *mucronata;* NBG 1486/32 *fimbriata;* NBG 1684/32, 1685/32 *blanda* x *villosula;* NBG 1812/32 *scabrifolia;* NBG 1819/32 *ecklonii* v. *latifolia* x *mucronata;* NBG 2034/32 *tubulosa* v. *tubiflora;* NBG 2051/32 *brachystachys;* NBG 2185/32 *pulchra;* NBG 2686/32 *stricta* v. *erectifolia;* NBG 2009/36 *lineolata.*

Lewis & Barker. NBG 2674/32, 2695/32 *sambucina.*

Liebenberg. 4565 *hypogea.*

Lloyd. MM 3621 *hypogea.*

Long. 437 *sambucina.*

Loubser. 472 *plicata.*

Louw. 1440 *hypogea.*

MacOwan. 272 *villosula;* 544 *tubulosa* v. *tubiflora;* 586 *pulchra;* 1567 *stricta* v. *sulphurea;* 2479 *tubulosa;* 2559 *ambigua;* HNAA 273 *nana* v. *angustifolia;* HNAA 543 *odorata;* HNAA 584 *rubrocyanea*, partly; HNAA 584 *villosa*, partly; HNAA 811 *pygmaea;* K/3 *stricta.*

Mader. Herb. MacOwan 2169 *scabrifolia;* Herb. MacOwan 2183 *brachystachys;* Herb. MacOwan 2208 *ambigua.*

Maguire. 1757 *villosa* x *stricta* v. *erectifolia;* 1758 *plicata;* 2031 *pulchra.*

Marloth. 177 *stricta*, partly; 177, 189 *plicata;* 576 *villosula;* 2160 *hypogea;* 3319 *sambucina;* 5611 *villosula;* 5663 *ambigua;* 6171 *sambucina;* 6739 *truncata;* 7170 *villosa;* 7226 *tubulosa* v. *tubiflora;* 7447 *hypogea;* 7468 *sinuata;* 7483 a *sambucina* v. *longibracteata;* 7483 b *framesii;* 7498 *pygmaea;* 7655 *vanzyliae;* 7938 *spathacea;* 9538 *hypogea;* 10219 *minuta;* 10228 *crispa;* 10439 *flabellifolia;* 10607 *sambucina;* 11467 *mucronata;* 12664 *namaquensis;* 12668 *tritonioides;* 12792 *sambucina*, partly; 12792 *flabellifolia;* 13201 *sambucina;* 13348 *namaquensis.*

Martin. 580 *patersoniae;* 860 *mucronata;* 4627 *villosula;* NBG 1567/30 *vanzyliae;* NBG 1771/31 *ambigua;* NBG 2862/35 *tubulosa* v. *tubiflora;* NBG 1246/36, 1226/37 *stricta;* NBG 1244/37, 1248/37 *scabrifolia;* NBG 1554/37 *vanzyliae;* NBG 982/38 *nana* v. *angustifolia.*

Mathews. NBG 267/13 *purpurea;* NBG 500/13 *pulchra.*

McLea. Herb. Bol. 2654 *hypogea.*

Meeuse. 9001 *hypogea.*

Middlemost. 1723 *sambucina;* NBG 1247/33 *odorata;* NBG 1424/37 *blanda;* NBG 1066/38 *stricta* v. *erectifolia.*

Mogg. 8849, 16057, 16183 *hypogea.*

Morris. 172 *patula.*

Moss. 7159 *hypogea;* 11416 *villosula;* 13000 *hypogea.*

Muir. 645 *nana* v. *angustifolia;* 1606, 1769 *patula;* 2390 *fourcadei;* 3446 *tubulosa* v. *tubiflora;* 4851 *nana* v. *angustifolia;* 4852 *patula;* 5038 *tubulosa* v. *tubiflora.*

Mund. 9 *purpurea.*

Nation. 185 *hypogea.*

Nelson. 396 *hypogea.*

Niven. 14 *plicata.*

Nouhuys. NH 8180 *obliqua.*

Oldenburg. 1414 *villosula.*

Pappe. SAM 21125 *tubulosa* v. *tubiflora;* SAM 21142 *ambigua,* partly; SAM 21142 *nana* v. *angustifolia,* partly; SAM 21146 *patersoniae;* SAM 21153 *villosa;* SAM 21155 *rubrocyanea;* SAM 21157 *plicata.*

Parker. 4626 *tubulosa;* 4630 *tubulosa* v. *tubiflora.*

Paterson. 39 *patersoniae;* 39 b, 2553 *sambucina.*

Paton. MM 3314 *hypogea.*

Pearson. 5773 *dregei* v. ? ; 6837 *attenuata;* 7070 *mucronata;* BH 15553 *plicata.*

Pegler. 1111 *hypogea.*

Penfold. 93 *plicata;* 100 *ambigua.*

Penther. 606 *lineolata;* 664 *ambigua;* 941 *villosula.*

Pfeil. 40 *namaquensis.*

Phillips. 25 *plicata;* 1316 *stricta* v. *erectifolia;* 1544 *sambucina;* SAM 26044 *villosula.*

Pillans. 7209 *tubulosa* v. *tubiflora;* 7272, 7703, 9105 *mucronata.*

Pole Evans. 2731 *hypogea;* NH 13357 *hypogea.*

Pont. 1199 *hypogea.*

Potgieter. 2 *hypogea.*

Rand. 195, 1191 *hypogea.*

Rehmann. 893 *stricta* v. *sulphurea;* 942 *villosula;* 1201 *stricta;* 1202 *villosula,* partly; 1202 *stricta,* partly; 1203 *ambigua;* 1435 *villosula;* 1847 *nana* v. *angustifolia;* 2224 *villosa;* 6574 *hypogea.*

Repton. 963 *hypogea.*

Reynolds. 5892 *hypogea.*

Rodin. 1247 *patersoniae;* 1331 *fourcadei;* 1444 *dregei.*

Rogers. 2953 *sambucina;* 4149 *nana* v. *angustifolia;* 4397 *ambigua,* partly; 4397 *patula,* partly; 11095 *pygmaea;* 11101 b *nana;* 11114 *framesii;* 11204, 11206 *ambigua;* 15536 *villosula;* 18273, 18722 *hypogea;* 27259 *villosula;* 28725 *plicata;* 28877, 29176 *purpurea.*

Ross-Frames. BH 19218 *flabellifolia;* BH 20837 *crispa;* NBG 1244/26 *framesii.*

Rycroft. 1980 *pygmaea.*

Salter. 333/11 *tubulosa* v. *tubiflora;* 333/14 *stricta;* 982 *klaverensis;* 1241 *blanda;* 1332 *odorata;* 1346 *pulchra;* 1493 *dregei;* 1729 *tubulosa* v. *tubiflora;* 2508 *minuta;* 2699 a *pulchra;* 2724 *ecklonii;* 2728 *lineolata;* 2809 *pulchra;* 3377 *villosula;* 3439 *blanda* x *villosula;* 3496 *minuta;* 3507 *scabrifolia* v. *declinata;* 3554 *villosula:* 3567 *nana* v. *angustifolia;* 3660 *lineolata;* 3677 *pulchra;* 3799 *curviscapa;* 3810 *attenuata;* 4671 *leipoldtii;* 4789 *purpurea;* 4847 *patula;* 4895 *tubulosa;* 5544 *striata* v. *planifolia;* 6231 *nana;* 6241 *stricta;* 6835 *stricta* v. *erectifolia;* 6835 *villosa* x *stricta* v. *erectifolia;* 6867 *pygmaea;* 7318 *salteri;* 7319 *pauciflora;* 7363, 7367 *villosula;* 7491 *lineolata;* 7518 *auriculata;* 7581 *mucronata;* 7666 *pulchra;* NBG 1720/31 *attenuata;* NBG 1158/32 *crispa;* NBG 1159/33 *scabrifolia.*

Sanderson. 951 *ambigua.*

Saunders. 15 *hypogea.*

Schelpe. 4733 *scabrifolia* v. *acuminata.*

Schenck. 557, 679 *stricta.*

Schlechter. 825, 1145 *villosula;* 1277 *nana* v. *angustifolia;* 1487, 1489 *tubulosa* v. *tubiflora;* 1541 *nana* v. *angustifolia;* 4055 *hypogea;* 4443, 4729 *hypogea* v. *longituba;* 4884 *odorata;* 5154 *lineolata;* 5154 *pulchra,* partly; 5163 *ambigua;* 5214 *rubrocyanea;* 5214 *ecklonii* v. *latifolia;* 5299 *pygmaea;* 7984 *scabrifolia;* 8185 *stenomera;* 8248 *pubescens;* 8337 *ambigua;* 8364 *ecklonii;* 8666 *geniculata;* 8856 *sambucina;* 10674 *pulchra;* 10725 *odorata;* 10892 *truncata;* 10910 *vanzyliae;* 10959 *sambucina* v. *longibracteata;* 10979 *sinuata;* 11041 *fimbriata.*

Schmidt. 340 *flabellifolia.*

Schoenfelder. 602 *hypogea.*

Schonland. 3010 *patersoniae.*

Scully. 26 *curviscapa*.

Sharpe. NH 7729 *hypogea*.

Shepherd. 1 *hypogea*.

Sidey. 1739 *patersoniae;* 1744 *fourcadei*.

Sieber. 128, 233 *villosula*.

Silke. 261 *hypogea*.

Smith. 43 *hypogea;* 2879, 2933 *ambigua;* 3180 *patula;* 6560 a *hypogea*.

Smuts. 1650 *hypogea*.

Sparrman. 57, 85 *villosula;* 131, 200 *tubulosa* v. *tubiflora*.

Stephens. 7072 *lineolata;* 7090, 7092, 7095 *mucronata*.

Stephens & Glover. 8607 *tubulosa* v. *tubiflora;* 8608 *lineolata*.

Steyn. 82, 186 *villosula;* 370 *mucronata;* 510 *ecklonii;* 567 *nana;* 576 *ambigua;* 601, 609 *pulchra;* 981 *hypogea*.

Steytler. NBG 1783/33 *purpurea*.

Stokoe. 8482 *unguiculata;* 8943 *patersoniae;* SAM 55602 *dregei;* SAM 55675 a *cedarbergensis;* SAM 55675 b *ecklonii;* SAM 55719 *patersoniae;* SAM 59866 *fimbriata;* SAM 59871 *flabellifolia;* SAM 59879 *odorata;* SAM 59881 *mucronata;* SAM 61623 *cedarbergensis;* SAM 63468 *mucronata* v. *longituba;* SAM 67328 *rubrocyanea;* SAM 67329 *tubulosa* v. *tubiflora;* SAM 68293 *mucronata* v. *longituba;* SAM 68294 *ambigua;* SAM 68428 *sambucina;* SAM 68586 *patula*.

Story. 1152 *flavida;* 2726 *sambucina;* 2903 *stricta* v. *erectifolia;* 3014 *villosa;* 3065 *purpurea;* 3076 *patula*.

Strey. 579 *stricta;* 580 *nana* v. *angustifolia;* 581 *villosula;* 582 *stricta* v. *sulphurea;* 591 *tubulosa* v. *tubiflora*.

Sutton. 260 *hypogea*.

Taylor. 310 *patersoniae;* BH 10055 *fourcadei*.

Teague. 488 *hypogea*.

Templemann. Herb. MacOwan 2478 *villosa*.

Theron. 1259 *sambucina* v. *longibracteata;* 2015 *pulchra*.

Thode. A 160, A 161 *villosula;* A 1946 *spathacea;* A 2084 *mucronata* v. *longituba;* A 2674 *sambucina*.

Thorne. SAM 41606 *fourcadei;* SAM 48855 *dregei;* SAM 51705 *sambucina;* SAM 52506 *spathacea;* SAM 52681 *auriculata;* SAM 52920 *nana;* SAM 52924 *lineolata;* SAM 53124 *blanda;* SAM 53366 *sambucina*.

Tyson. 312 *hypogea* v. *ensifolia*.

Van der Merwe. 1257 *hypogea*.

Van Heerde. BH 23639 *striata*.

Van Niekerk. 96 *fourcadei;* 156 *blanda* x *villosula;* 163 *odorata*.

Van Zyl. BH 17698 *vanzyliae;* BH 17823 *ecklonii;* NBG 625/27 *ecklonii* v. *latifolia*.

Verdoorn. 1832 *striata;* 1859 *truncata;* 1892 *lobata*.

Wagener. 197 *cedarbergensis*.

Walgate. 272 *nana* v. *angustifolia;* 287 *stricta* v. *regia;* 291 *plicata;* 341 *patersoniae*.

Wallich. 1167 *tubulosa* v. *tubiflora*.

Walt & Brandwyk. 2490 *hypogea*.

Wasserfall. 233 *ambigua* x *nana* v. *angustifolia;* 234 *nana;* 444 *tubulosa* v. *tubiflora;* 445 *nana;* 455 *rubrocyanea;* 940 *tubulosa;* 953 *pulchra*.

Wilman. 436 *hypogea;* 774 *pulchra*.

Wilms. 1424 *hypogea;* 3682 *ambigua*, partly; 3682 *nana* v. *angustifolia*, partly; 3684, 3686 *plicata;* 3687 *villosula*.

Wright. 263 *stricta*.

Wurts. 253, 272 *patula;* 312 *patersoniae;* 1226 *sambucina;* 1433 *scariosa*.

Zeyher. 62 *nana;* 91 *tubulosa* v. *tubiflora;* 129 *stricta;* 394 *pulchra;* 1613, 1613 a, 1613 b *stricta;* 1614 *villosula;* 1616 *odorata;* 3998 *patersoniae;* 4000 *nana* v. *angustifolia;* 4001 *patersoniae;* 4002 a, 4002 b *patula;* 4003 *montana;* 5043 *plicata*.

INDEX.

PAGE

ACASTE
pulchra Salisb. 8, 48
venusta Salisb. 8, 36
ACIDANTHERA
brachystachys Baker 125
ANACLANTHE
plicata (L. f.) N. E. Br. 138
ANAPALINA
revoluta (Burm. f.) N. E. Br. 137
ANTHOLYZA
fimbriata Klatt 132
hypogea (Burch.) Klatt 112
ringens L. 138
striata (Jacq.) Klatt 129
BABIANA
adpressa Lewis 69
ambigua (Roem. & Schult.) Lewis 64
angusta N.E. Br. 80
angustifolia Eckl. 80
angustifolia Sweet 48
atrocyanea Eckl. 49
atrodeltoidea Eckl. 49
attenuata Lewis 102
auriculata Lewis 88
bainesii Baker 112
bakeri Schinz 112
blanda (L. Bolus) Lewis 30
brachystachys (Baker) Lewis 125
buchubergensis Dinter 76
caerulescens Eckl. 57, 136
caesia Eckl. 43
cedarbergensis Lewis 82
crispa Lewis 84
cuneifolia Baker 110
curviscapa Lewis 107
densiflora Klatt 124
disticha Eckl. 28
disticha Ker 53
dregei Baker 106
ecklonii Klatt 104
ecklonii Klatt var. latifolia (L. Bolus) Lewis 105
erectifolia Lewis 43
falcata Lewis 115
fastigiata L. Bolus 104
fimbriata (Klatt) Baker 132
flabellifolia Harv. ex Klatt 98
flavida Lewis 117
flavocaesia Eckl. 44
foliosa Lewis 35
fourcadei Lewis 92
fragrans Eckl. 77, 80
framesii L. Bolus 97
framesii L. Bolus var. kamiesbergensis Lewis 98
gawleri N. E. Br. 93

PAGE

BABIANA (*cont.*)
geniculata Lewis 109
gladiola Spreng. ex Steud. 136
hiemalis L. Bolus 28
horizontalis Lewis 90
hypogea Burch. 112
hypogea Burch. var. ensifolia Lewis 114
hypogea Burch. var. longituba Lewis 115
intermedia L. Bolus 49
klaverensis Lewis 72
lata Lewis 32
latifolia L. Bolus 105
leipoldtii Lewis 33
lilacina Eckl. 53
lineolata Klatt 51
lobata Lewis 135
longibracteata Lewis 95
longicollis Dinter 103
longiflora Steud. 136
macrantha MacO. 32
macrantha MacO. var. *blanda* L. Bolus 30
maculata Klatt 80
minuta Lewis 74
mononeura Baker 136
montana Lewis 63
mucronata Baker 68
mucronata Baker var. *longicollis* Baker 93
mucronata (Jacq.) Ker 58
mucronata (Jacq.) Ker var. longituba Lewis 60
mucronata (Jacq.) Ker var. minor Lewis 60
multiflora Klatt 137
namaquensis Baker 76
nana (Andr.) Spreng. 77
nana (Andr.) Spreng. var. angustifolia (Eckl.) Lewis 80
nana (Andr.) Spreng. var. confusa Lewis 81
nervosa Ker 137
obliqua Phillips 67
obtusifolia Ker. 28
occidentalis Baker 68
ochroleuca Sweet 137
odorata L. Bolus 60
orthosantha Baker 28
parviflora Brehm. ex Klatt 137
patersoniae L. Bolus 55
patula N. E. Br. 62
pauciflora Lewis 99
pilosa Lewis 87
plicata Baker 65
plicata Baker var. *forsteri* Baker 77

PAGE
Babiana (*cont.*)
plicata Baker var. *maculata* (Klatt) Baker 80
plicata Ker 53
pubescens (Lam.) Lewis .. 110
pulchra (Salisb.) Lewis .. 48
punctata Klatt 137
punicea Eckl. 38
purpurea (Jacq.) Ker 47
pygmaea Baker 77, 81
pygmaea (Burm. f.) N. E. Br. 32
pygmaea Spreng. MS. 77
quadripartita Klatt 137
reflexa Eckl. 57
reflexa (Licht.) Ker 138
ringens (L.) Ker 138
rosea Eckl. 138
rubrocoerulea Rchb. 36
rubrocyanea (Jacq.) Ker .. 36
salteri Lewis 73
sambucina Eckl. 40
sambucina (Jacq.) Ker .. 92
sambucina (Jacq.) Ker var. longibracteata Lewis .. 95
sambucina (Jacq.) Ker var. undulato-venosa (Klatt) Lewis.. 96
sambucina (Jacq.) Ker var. unguiculata Lewis 95
scabrifolia Brehm. ex Klatt .. 68
scabrifolia Brehm. ex Klatt var. acuminata Lewis .. 70
scabrifolia Brehm. ex Klatt var. declinata Lewis .. 71
scariosa Lewis 122
schlechteri Baker 80
schlechteri Baker 112
secunda (Thunb.) Ker .. 57
sinuata Lewis 128
socotrana Hook. f. 91
spathacea Ker 93
spathacea (L. f.) Ker 124
spiralis Baker 132
sprengelii Baker 77
stellata Eckl. 138
stellata Schltr. 93
stenomera Schltr. 127
stenophylla Baker 51
striata (Jacq.) Lewis 129
striata (Jacq.) Lewis var. planifolia Lewis 130
stricta (Ait.) Ker 40
stricta (Ait.) Ker var. 48
stricta (Ait.) Ker var. *angustifolia* (Sweet) Baker.. .. 49
stricta (Ait.) Ker var. erectifolia Lewis 43
stricta (Ait.) Ker var. grandiflora Lewis 46
stricta (Ait.) Ker var. *obtusifolia* (Ker) Baker 28

PAGE
Babiana (*cont.*)
stricta (Ait.) Ker var. *purpurea* (Jacq.) Ker 47
stricta (Ait.) Ker var. *reflexa* (Eckl.) Baker 57
stricta (Ait.) Ker var. regia Lewis.. 45
stricta (Ait.) Ker var. *rubrocyanea* (Ker) Baker 36
stricta (Ait.) Ker var. sulphurea (Jacq.) Baker .. 44
stricta (Ait.) Ker var. *villosa* (Ait.) Baker 38
subglabra Lewis 69
sulphurea (Jacq.) Ker.. .. 44
tenuiflora Sweet 138
thunbergii Ker 138
torta Lewis 86
tritonioides Lewis 134
truncata Lewis 100
tubata (Jacq.) Sweet 118
tubiflora Eckl. 104
tubiflora (L. f.) Ker 120
tubiflora (L. f.) Ker var. *filifolia* Pappe ex Baker .. 120
tubiflora (L. f.) Ker var. *tubata* (Jacq.) Ker 118
tubulosa (Burm. f.) Ker .. 118
tubulosa (Burm. f.) Ker var. tubiflora (L. f.) Lewis .. 120
umbellata Ker 138
undulato-venosa Klatt.. .. 96
unguiculata Lewis 131
vanzyliae L. Bolus 85
velutina Schltr. 104
velutina Schltr. var. *nana* Schltr. 109
villosa Eckl. 28
villosa (Ait.) Ker 37
villosa (Ait.) Ker var. grandis Lewis.. 39
villosula (Gmel.) Ker ex Steud. 28
Bobartia
umbellata (Thunb.) Ker .. 138
Gladiolus
ambiguus Roem. & Schult. .. 64
angustifolius Lam. 120
crispus Thunb.. 84
distichus (Ker) Roem. & Schult. 53
elongatus Salisb. 120
formosus Pers. 129
fragrans Jacq. 53
inclinatus DC. 120
latifolius Lam.. 38
longiflorus Andr. 118
mucronatus DC. 37
mucronatus Jacq. 58
mucronatus Lam. 64
nanus Andr. 77
nervosus Lam. 40
paleaceus Vahl 124
plicatus Ait. 40
plicatus Andr. 44

PAGE
GLADIOLUS (*cont.*)
plicatus Jacq. 53
plicatus angustifolius Jacq. 51
plicatus Lam. 120
plicatus L. 28
plicatus Thunb. 53
pubescens Lam. 110
puniceus (Jacq.) Vahl 37
purpureus (Jacq.) Willd. 47
reflexus Licht. 138
ringens Thunb. 40
rubrocyaneus (Jacq.) Vahl 36
sambucinus Jacq. 93
secundus Thunb. 57
spathaceus L. f. 124
stenophyllus Schrank 51
striatus Jacq. 129
strictus Ait. 40
strictus Lam. 51
sulphureus Jacq. 44
tubatus Jacq. 118
tubatus Jacq. var. 118
tubiflorus L. f. 120
villosus (Ait.) Vahl 38
villosulus (Gmel.) Roem. & Schult.) 28
HEBEA
formosa Eckl. 129
HOMERIA
umbellata (Thunb.) Lewis 138

PAGE
IXIA
africana Hornem. 36
coerulescens Pers. 28
corymbosa Burm. f. 77
cyanea Pers. 36
flabellifolia De la R. 57
flabelliformis Salisb. 47
paniculata De la R. 136
pigmaea Burm. f. 32
plicata Lam. 40
plicata L. 28
punicea Jacq. 37
purpurea Jacq. 47
purpurea Jacq. var. 38
rubrocyanea Jacq. 36
scillaris L. 42
scillaris Mill. 40
tubulosa Burm. f. 118
villosa Ait. 37
villosa Jacq. 28
villosa Jacq. var. 49
villosa Schneevogt. 36
villosula Gmel. 28
LAPEIROUSIA
corymbosa (L.) Ker 79
TRITONIA
crispa (Thunb.) Ker 84
scillaris (L.) Baker 42
striata (Jacq.) Ker 129

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